

MODERN REFRIGERATION

AND AIR CONTROL

Vol. 63 No. 750

SEPTEMBER, 1960

Price 2s. 6d. monthly

SMITHS

**have many strings
to their bow...**

Our great achievements in designing and building many of the largest and most up-to-date cold stores in the country have taken us right to the forefront of the industry. But the design and construction of large cold stores is not our only activity. We are also specialists in all the "built-in" applications of insulation, factory insulation, and pipe insulation and boiler covering; have been for years! No job has ever proved too big or too difficult for Smiths, so if you have a project in mind of any sort involving insulation or cold storage, why not consult our design engineers first? There will be no cost or obligation, and remember, we can handle the job completely, right from the original drawings.

Cold Store design and construction

"Built-in" applications of Insulation

Factory Insulation

**Pipe Insulation and Boiler
Covering**

Smiths Insulations Ltd.

Est. 1874 **Burton-on-Trent** Tel: 2061/2

London Office: 105 Empire House, St. Martins-le-Grand, E.C.1. Tel: MONarch 2000



REFRIGERATION FITTINGS—

angle valves dehydrators receivers unions
compressor valves filters sight glasses
flare nuts elbows tees rupturable discs

manufactured by



HRP
LIMITED

Stockist—

“R.A.” PLATE COILS
FINNED COILS

“HOOVER,” “CROMPTON”
and “DELCO” MOTORS

UNIT S.A.E.R. COOLERS

COPPER TUBING

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THERMOMETERS

“EDWARDS”
DEHYDRATING UNITS

“SEARLE-BUSH” COOLERS

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Official Stockist



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THERMOSTATS
WATER VALVES
PRESSURE CONTROLS
THERMOMETERS
ALARM THERMOSTATS
MAGNETIC VALVES
PACKLESS LINE VALVES
FREEZER ALARMS
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HRP
LIMITED

A comprehensive supply of Equipment

99 KINGS ROAD, CHELSEA, S.W.3.

Manufacturing Engineers

TELEPHONE : FLAXMAN 1144 (3 LINES)

The "MINIVEIL" air curtain permits the cold store door to remain open for prolonged periods, giving completely free passage for men and goods, with a negligible rise in store temperature. No longer need you bother about the constant opening and closing of coldroom doors or the proper operating of air locks by the coldroom staff. You can rely on the protection afforded by the curtain of air provided by a "MINIVEIL" unit.



MINIVEIL

AIR CURTAIN UNIT

FOR OPEN COLD STORE DOORS



For efficient Cold Storage operation

The Minikay System keeps new insulation permanently dry and dries out existing wet insulation.

The Minikay System eliminates the heavy cost of re-insulation.

The Minikay System extends the life of your cold store to that of normal buildings. Cold Storage insulation is extremely valuable—protect it with Minikay.



MINIKAY



DEHYDRATION

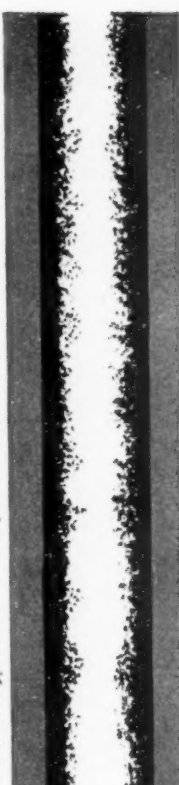
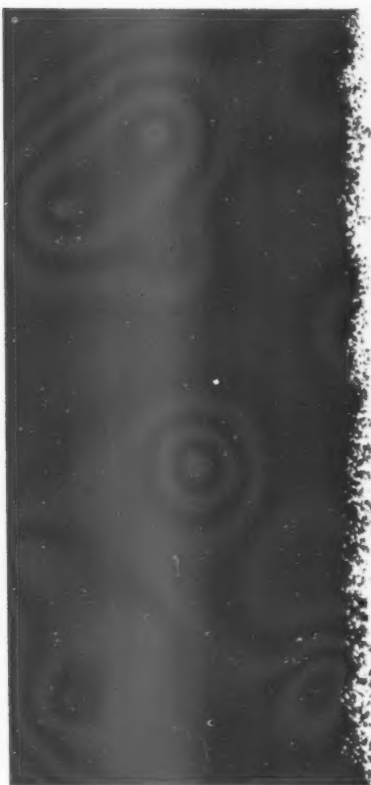
FOR PERMANENTLY DRY INSULATION

MINIKAY LIMITED

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Telephone: LONDON Wall 6581

Telegrams: MINIKAY STOCK LONDON Cables: MINIKAY LONDON



**Minimum
corrosion,
minimum
frost build-up
with
'THERMOCAL' DF**

**I.C.I.'s new heat-transfer
medium for
industrial refrigeration**

'THERMOCAL' DF—most anti-corrosive of all glycol based heat-transfer media now employed in industrial refrigeration—is widely used to prevent frost build-up on primary refrigeration coils; it can also be used as the main coolant.

'THERMOCAL' DF sets a new standard of corrosion-resistance—with a corresponding (and profitable) reduction in plant maintenance and stoppages.

Aqueous solutions of 'THERMOCAL' DF freeze well below 0°C. and can be used as defrosting fluids, industrial coolants and heat-transfer media between -40°C. and 100°C. These solutions have outstanding resistance to corrosion, high specific heats and thermal conductivities, long-term stability over a wide range of temperature, low coefficients of expansion and low flammability.

Think about 'THERMOCAL' DF—if you want to know more about it, please write. For a technical visit, please get in touch with your nearest I.C.I. Sales Office.

**IMPERIAL CHEMICAL INDUSTRIES LTD.,
LONDON, S.W.1.**





Effective insulation is a question of balance

STYROCELL is a rigid, lightweight material consisting of a profusion of non-communicating air cells encased in polystyrene. By maintaining a fine balance between its weight and the volume of trapped air, STYROCELL provides a barrier of virtually still air—the ideal thermal insulant. In addition to its light weight—1 lb. per cubic foot—STYROCELL is inert, rot-proof and possesses a

low water-vapour permeability, good mechanical strength, chemical resistance and electrical properties. Easy to handle and to work, STYROCELL is an inexpensive material that gives new meaning to effective thermal insulation. Available in either standard or self-extinguishing grades—in thicknesses from $\frac{1}{2}$ " - 10".

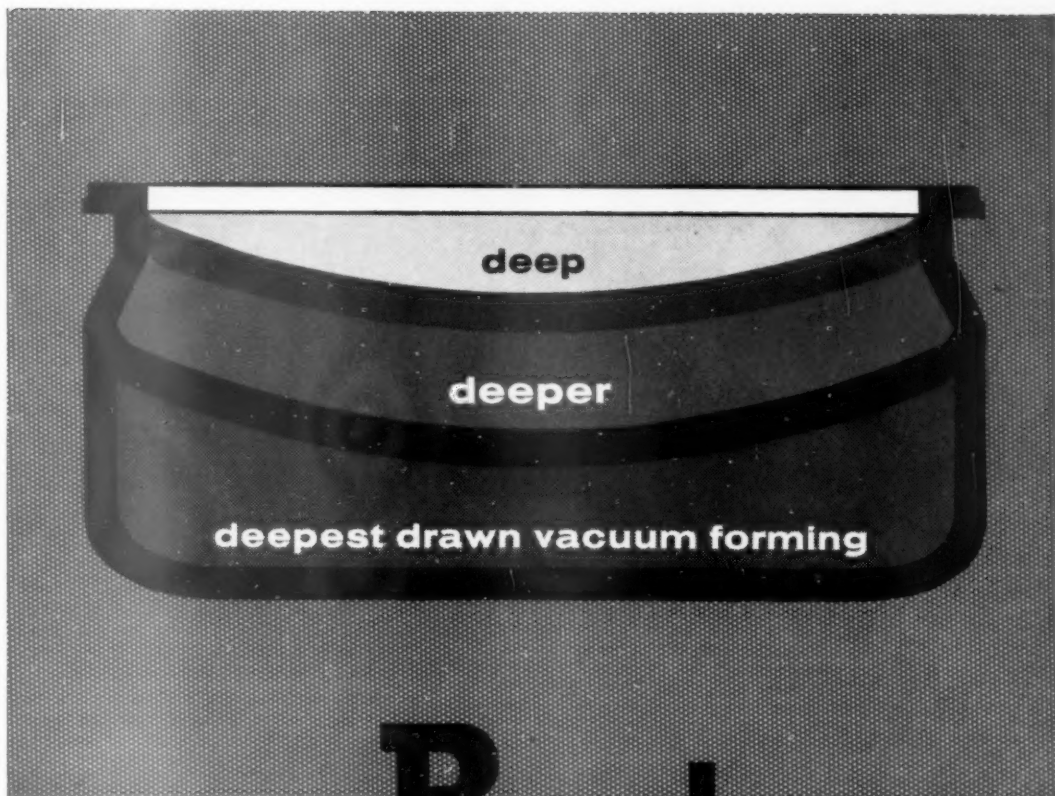


STYROCELL

Further details may be obtained from
SHELL CHEMICAL COMPANY LIMITED, 170 PICCADILLY, LONDON, W.1

SHELL and *STYROCELL* are registered trade marks

38.5



Bextrene

SHEET for Frigidaire

From a flat Bextrene sheet to a deep Hydrator pan, Bextrene toughened polystyrene sheet has that third-dimensional reserve so essential for vacuum forming deep shapes with consistent ease. That's why The General Celluloid Company Ltd. chose tough, easy-forming Bextrene for making this Hydrator pan for the Frigidaire Division of General Motors Ltd. Extruded polystyrene sheets, rolls or panels in opaque colours are by far the most accommodating material for this thermoplastic technique. Write for leaflet and don't hesitate to deep-draw on the wide practical experience of the BX Plastics Technical Service.



BX PLASTICS LTD. *A Subsidiary of The British Xylonite Co. Ltd.*
 Cobex and Bextrene Sheet Sales Division
 Manningtree, Essex Tel: Manningtree 401
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THIS SHRINKING WORLD and an **EXPANDING** organisation

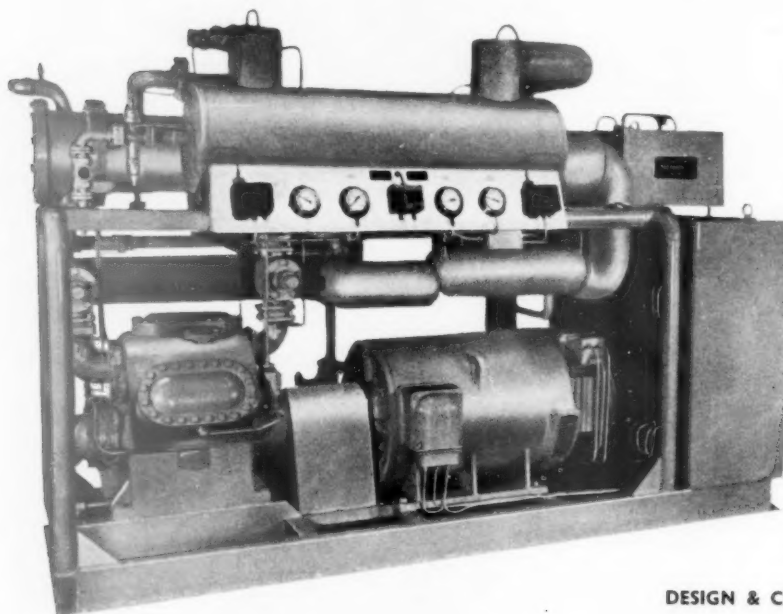
The giant strides of modern transportation do more than annihilate distance; they can bring you the truly world-wide "know how" of a group of Companies with a refrigeration background of nearly 100 years.

This expanding organisation is a new concept of international co-operation in engineering, and the fruits of this hard-won experience are in the many types of refrigeration plant made available to you by Alfred Porter and Company.



NO CASE FOR WASTE SPACE in the 50 TR water chilling plant, carefully devised and engineered as a packaged unit. The condenser water pump and the chilled water pump are both accommodated on the same base. All motors operating the compressor, water and chilled water pumps are controlled from the multi-motor control panel; the unit is foolproof in operation and is protected in every possible way.

The stringent conditions imposed by the Oil Companies' Materials Association Committee are more than fulfilled in the motors, wiring and control gear and all piping and wiring is carried out and rigorously tested in the factory. Installation is a matter of three simple connections: electricity supply to the main isolator, water supply for the condenser, and output for the chilled water service.



COMPRESSOR

6-cylinder V/W construction
4½-in. bore × 3½ in. stroke,
directly driven; 6-pole electric
motor. Inbuilt capacity control.

CONDENSER

Extended surface shell and tube
type.

EVAPORATOR

Non-ferrous construction
throughout for minimum corrosion. Extended surface tubes,
direct expansion, minimum
refrigerant charge.

PERFORMANCE

Nominal 50 tons, cooling
water to 50° F. in designed
ambient 120° F. Condenser
rated fully tropically, i.e. 95° F.
flow.

DIMENSIONS

11 ft. long × 4 ft. wide ×
6 ft. 6 in. high.

DESIGN & CRAFTSMANSHIP AT THEIR BEST!

Write for particulars to Room B3—

ALFRED PORTER & CO. LTD.

STELLA WORKS, STANLEY RD., TEDDINGTON, MIDDLESEX

Teddington Lock 4406-7-8



DAVID SCOTT

9 TIMES

AS EFFICIENT
AS EXISTING DRIERS

This is good news for all sealed refrigeration system manufacturers. David Scott high side molecular sieve driers are now nine times more efficient than any other driers made. With a desiccant consisting of a molecular sieve filled with type 4A 8 x 12 mesh beads, they have actually nine times the normal adsorption. Consider the economic advantage. With David Scott high side driers you save size and weight.

FIRST CLASS CONSTRUCTION

Construction of these remarkable new driers is carried out in spun copper shell with a desiccant between two fine-mesh strainers. Outlets screen is of bag construction with secure retention in a brass ring pressing. This is formed from a 150 mesh twill weave wire cloth or equivalent in either phosphor bronze or monel.

PRE-PURCHASE PROTECTED

The greatest care is taken to ensure 100% efficiency. All driers are manufactured and stored in an air-conditioned atmosphere.

EASE AND SAFE TRANSPORTATION

Though there is the minimum risk of moisture adsorption from the surrounding atmosphere, David Scott new high side driers can be individually sealed before leaving the factory. All driers are shipped in hermetically sealed canisters.

Inlet and outlet connections conform to manufacturers' own requirements.

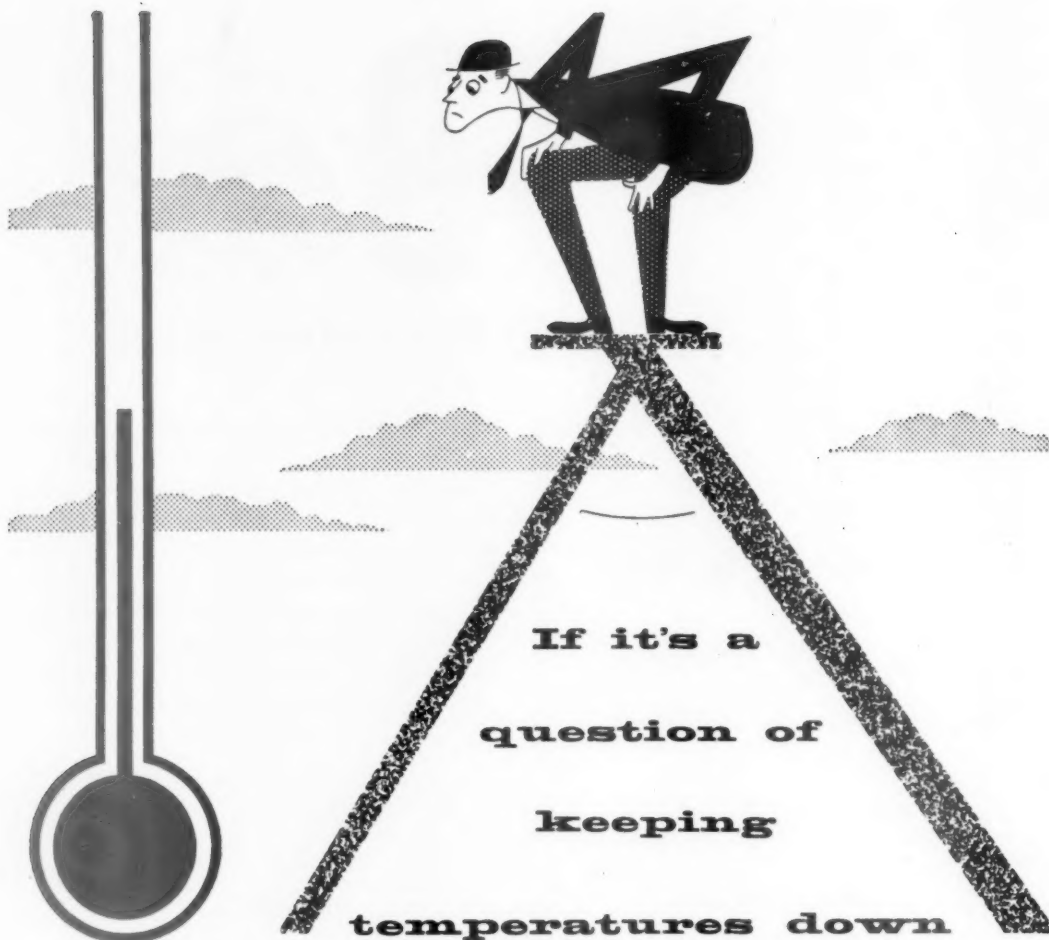
Other David Scott products include RECHARGEABLE DRIERS from 4" o/d to 14" o/d pipe, and ACCUMULATOR DRIERS with copper shell squeezed and silver soldered at each end.

A special feature of the David Scott service is the manufacture of driers to clients own specifications.

DAVID SCOTT & CO. LTD.

KELVIN AVENUE, HILLINGTON, GLASGOW

Telephone Halfway 4621



Whenever low temperature insulation is concerned, Newalls are the people to look to. They have a background of over 50 years experience in all kinds of contracts—in cold stores, in cargo and passenger ships, in breweries and creameries — in fact wherever there are refrigerated spaces.

Newalls supply *and* apply low-temperature insulation materials and their service is available through each of eight depots situated throughout the United Kingdom. When the specification calls for a first class job, call in Newalls.

Newalls

LOW-TEMPERATURE INSULATION

NEWALLS INSULATION CO. LTD. *Head Office* : WASHINGTON, CO. DURHAM.

A member of the TURNER & NEWALL ORGANISATION

Offices and Depots at LONDON, GLASGOW, MANCHESTER, NEWCASTLE UPON TYNE, BIRMINGHAM, BELFAST, DUBLIN, BRISTOL and CARDIFF.

Agents and Vendors in most markets abroad,

A BIG HAND FOR IRIDON

At home, at work, in transport and even on holiday—everywhere IRIDON Plastics are in evidence. On every hand—in every hand—IRIDON Plastics are replacing more traditional materials. Extensive research produces more and more reasons why they are being used. Mechanical reasons, chemical reasons, dielectric reasons, economic reasons.

Now the extensive range of IRIDON Plastics covers a wider field than ever before and includes:

- * High-Impact Polystyrene Sheeting
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- * 1000 Polythene Sheeting
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- * Polypropylene Sheeting
- * Clear P.V.C. Sheeting
- * Calendered P.V.C. Sheeting
- * Extruded P.V.C. Sheeting
- * Press Polished P.V.C. Sheeting
- * A.B.S. (Acrylonitrile Butadiene Styrene)

We shall be pleased to supply detailed information on request.

Iridon

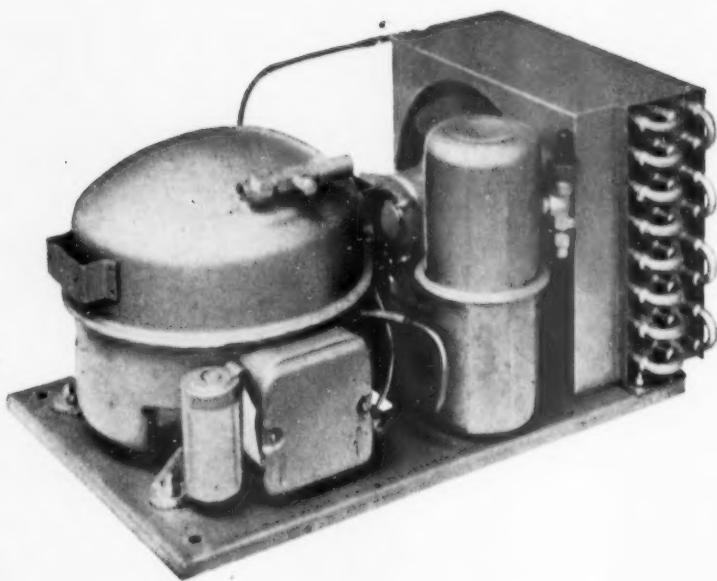
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Member of the CP group—one of the world's major producers of plastic sheet and film.

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Telephone: HYDe Park 9261

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CAPITAL N.F. 5.000.000

Household and commercial compressors
and condensing units 1/14 to 1 HP.
Household and commercial systems



PERFEX 47 9

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PRODUCTS COMPANY

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and TECHNICAL LABORATORIES

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FACTORIES LA VERPILLIÈRE
ISERE

**Cooling
Freezing
Refrigerating**



Basically the same problems are involved, problems best solved by using Spiro-Gills extended surface tubing.

Our comprehensive range of gilled tubes is used in refrigeration plant all over the world. We also supply condensers, evaporators and air coolers for use with all refrigerants. We are specialists in 'specials' too. Let us know your

special requirements and we shall design and supply the equipment to meet them. Or we can build assemblies to your own design. It will save you time and money to exploit our extensive experience.

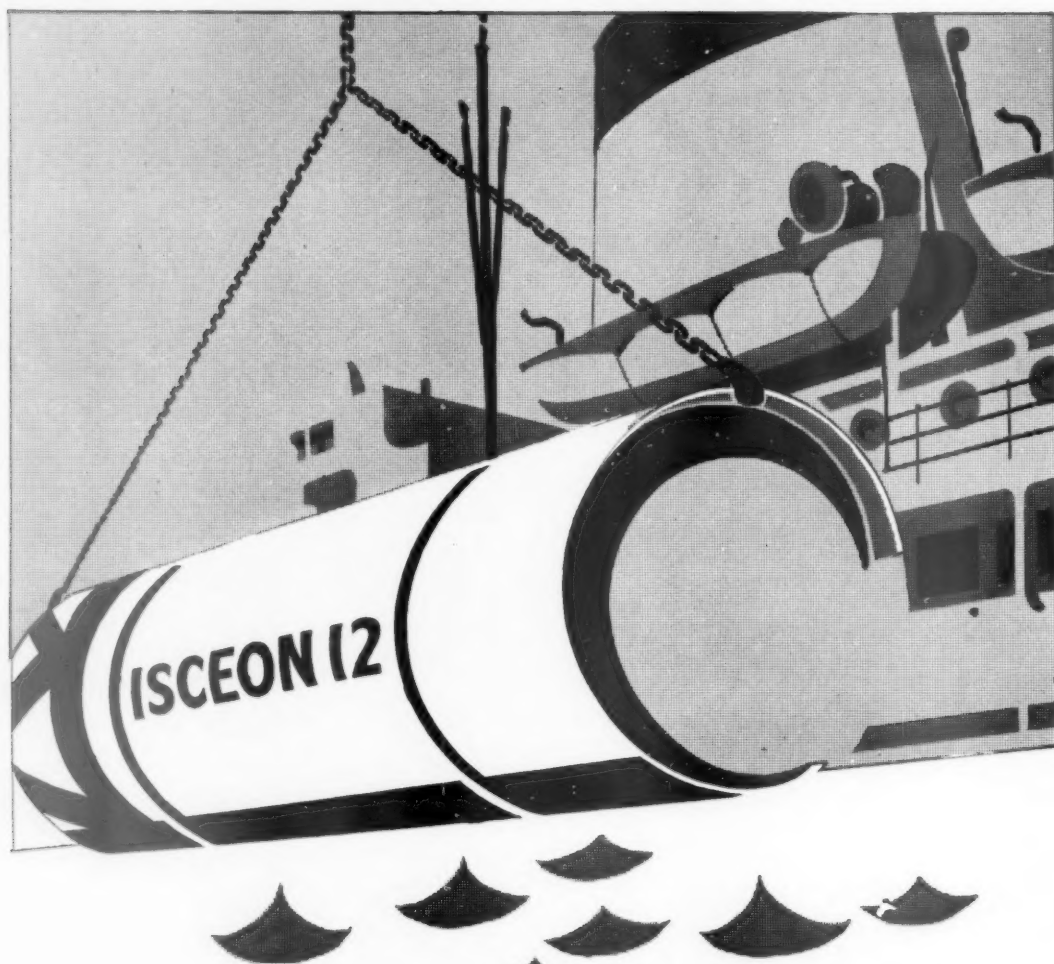
Our Technical Department is at your service. We look forward to hearing from you.

Consult

SG

Ltd

SPIRO-GILLS LTD. LONDON ROAD, PULBOROUGH, SUSSEX TELEPHONE: PULBOROUGH 2401/5



...and the Australia run!

Ice cold realism, deep freeze protection, they're taking
abroad the guarantee of perfect refrigeration for the long journey there and back.

Any other healthy reason for selecting ISCEON 12?

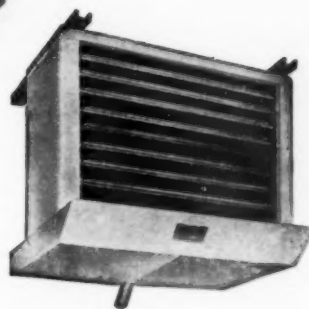
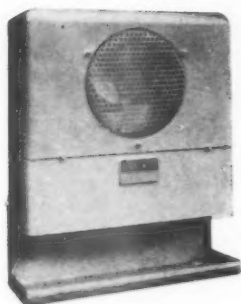
Yes. It's non-inflammable, non-combustible, non-irritant
and non-toxic, with the highest degree of purity.

All vital factors, all valid reasons for selecting
ISCEON 12 for refrigeration ships.



CONSOLIDATED ZINC CORPORATION (SALES) LIMITED
LONDON, W.1

**You can take the Stated Duty
of**

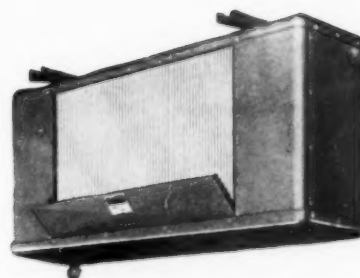
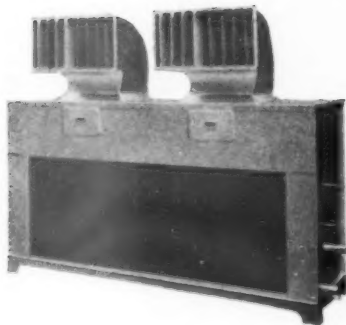


**for
GRANTED**

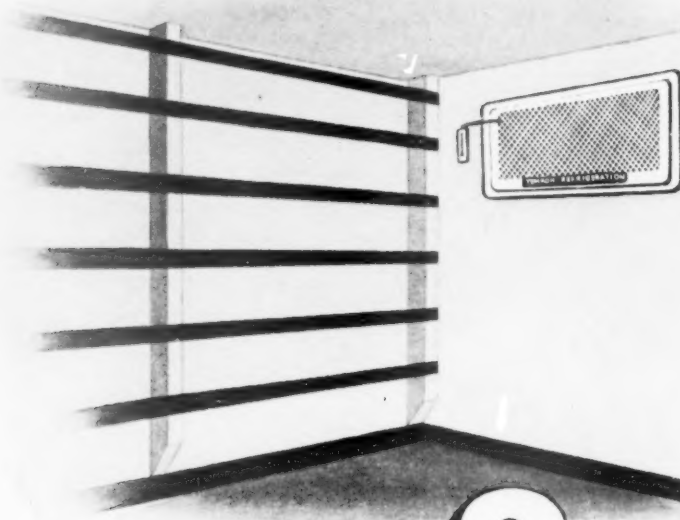
96 STANDARD MODELS FROM 1,200 TO 270,000 BTU's/HR

SUITABLE FOR AN INFINITE VARIETY OF APPLICATIONS

Each Fully Guaranteed



A cold room refrigeration plant



complete
for only

£180

Only

TEMKON

Packaged Units make this possible!

They are completely self-contained — are delivered factory wired and piped for easy, low-cost installation — supplied with installation kit.

- ★ Low temperature range — 5°F to +38°F.
- ★ Medium temperature range 36°F to 60°F.
- ★ 1½ Horse power.
- ★ Hermetically sealed — refrigerant charged for life.
- ★ Suitable for HOTELS—SHOPS—CATERING ESTABLISHMENTS—SUPERMARKETS—MOBILE APPLICATIONS—ETC.

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LIMITED**

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Phone: RENOWN 5813 (P.B.X.) Cables: TEMTUR LONDON

LARGEST PRODUCER OF PACKAGED AIR COOLING PLANTS OUTSIDE THE U.S.A.

**Use this coupon!*

AND GET FULL DETAILS OF THIS
PACKAGED REFRIGERATION UNIT

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POSITION _____

COMPANY'S NAME _____

ADDRESS _____

P. 4399



The luxury Skyway Hotel
at London Airport
has refrigeration
by Frigidaire

For the Skyway... it had to be Frigidaire

Only the best would do!

To the Skyway Hotel, being able to serve good, *fresh* food, twenty-four hours a day, is of vital importance. Frigidaire help solve the problem with trouble-free, reliable refrigeration. Altogether fourteen pieces of refrigerated display and storage equipment have been specially designed for the Skyway Hotel.

FRIGIDAIRE IN THE KITCHEN!

In the American-style kitchens, refrigerated cabinets store perishable food, before and after preparation. A serving cabinet is situated near the dining room service door so that waiters can select prepared dishes for immediate service.

FRIGIDAIRE IN THE BAR!

In the American Bar, the longest of its type in the country, cooling cabinets and shelves maintain an endless supply of wines, beers and soft drinks to quench the travellers' thirst.

FRIGIDAIRE FOR THE DINING ROOM! →

In the dining room, a refrigerated sideboard displays and stores an extensive cold buffet giving the diners a chance to select their own dishes.

IN THE BASEMENT TOO!

Here there are Frigidaire cold stores for pastry, dairy, meat and frozen food products. Also attached to the meat room is a separate refrigerated fish locker.

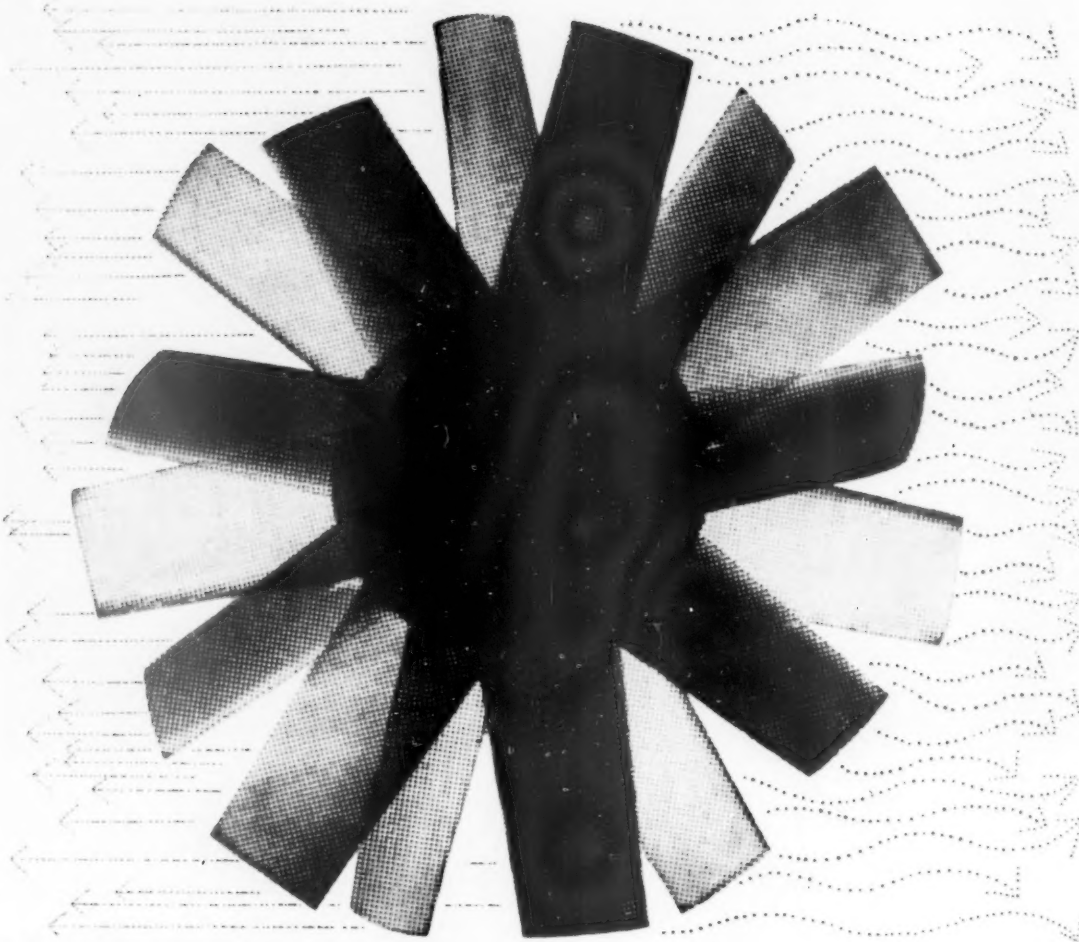
IF YOU NEED REFRIGERATION—big or small, why not get in touch with Frigidaire?—for modern refrigeration.



FRIGIDAIRE means business—for you!

Ralph T. M.

FRIGIDAIRE DIVISION OF GENERAL MOTORS LIMITED, STAG LANE, KINGSBURY, LONDON N.W.9



BLOW HOT, BLOW COLD Any number of heat transfer problems are being solved more simply with **IMPALCO** aluminium heat exchange materials. Three are particularly successful — 'Tube-in-Strip' (which speaks for itself), Impalco Heat Transfer Sheets, which give you tubeways to your own design, and 'Integron' finned tubing. They have one thing in common — their integral construction. Between them, they provide the logical, efficient and economic way of transferring heat from one medium to another in condensing, evaporating, heating or cooling plant. Make life easier for yourself — write to us for details of these exceptionally useful and versatile materials.

impalco
 **aluminium**

Imperial Aluminium Company Limited - Birmingham

Lec

WINS THE SPACE RACE

with the

12-SIX
.....
model S.18

Dual-Temp refrigerator freezer

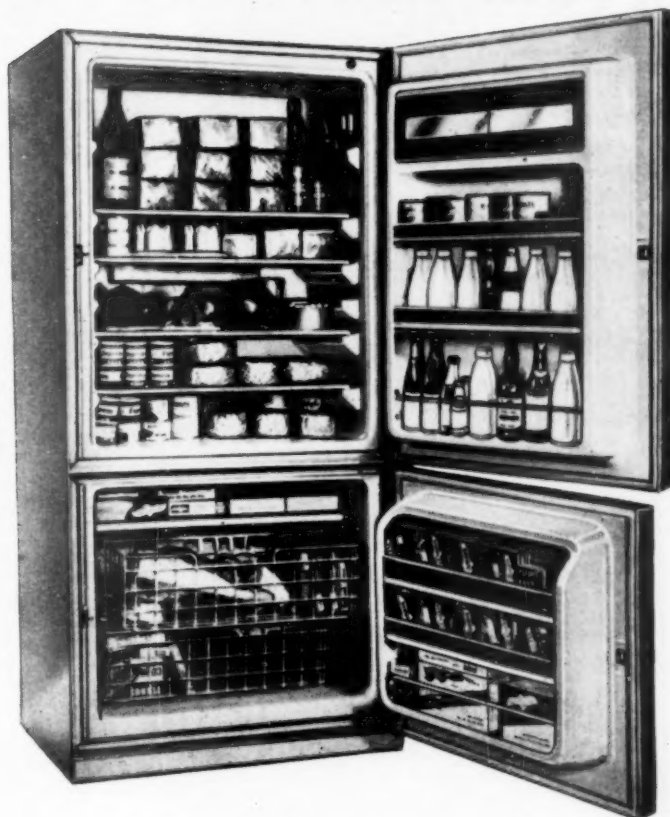
This handsome giant is an outstanding new advance in refrigeration, giving 12 cu. ft. refrigerator and 6 cu. ft. freezer in a single unit of superb design and faultless manufacture.

DIMENSIONS:

Height 74", Width 34", Depth 30"
(approx. only)

Price **£179 10. 0.**

including 12 months' service fee of £10.



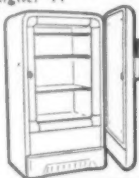
SPECIAL FEATURES OF THE LEC 12-6

Model S18

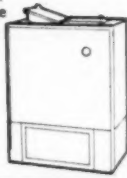
Tall Bottle Area
Sliding Shelves
Butter & Cheese Compartments
Adjustable Aluminium Door Racks
Trimline Styling
Sliding Frozen Storage Baskets
Freezer Door Shelves

Other models from the great LEC range

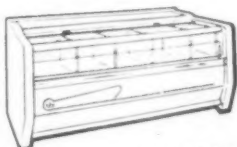
HF 4
Upright Freezer. Capacity:
4 cu. ft. Height: 44"
Length: 23½"
Width: 23"
Price:
£71.0.0.*



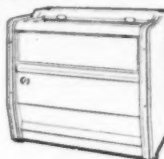
C 9
Conservator.
Capacity 3 cu. ft.
Holds 15 gals. ice
cream or 120 lb.
frozen food.
Price: £74.0.0.*



GS 91
Super Salesman. Capacity:
11.4 cu. ft. Height: 42½"
Length: 72". Width: 30".
Price: £230.10.0.*



GSD 71
Junior Salesman. Capacity:
7.1 cu. ft. Height: 42½". Length:
46". Width: 30".
Price:
£149.10.0.*



* Prices include 12 months' service fee

It's the newest achievement by Lec

Full range of our products can be seen at our London Showrooms:—
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Tel: REGent 6607

POST THIS COUPON TODAY!

To: Lec Refrigeration Ltd., Bognor Regis, Sussex

Please send me full details of the Lec 12-6 and other commercial cabinets.

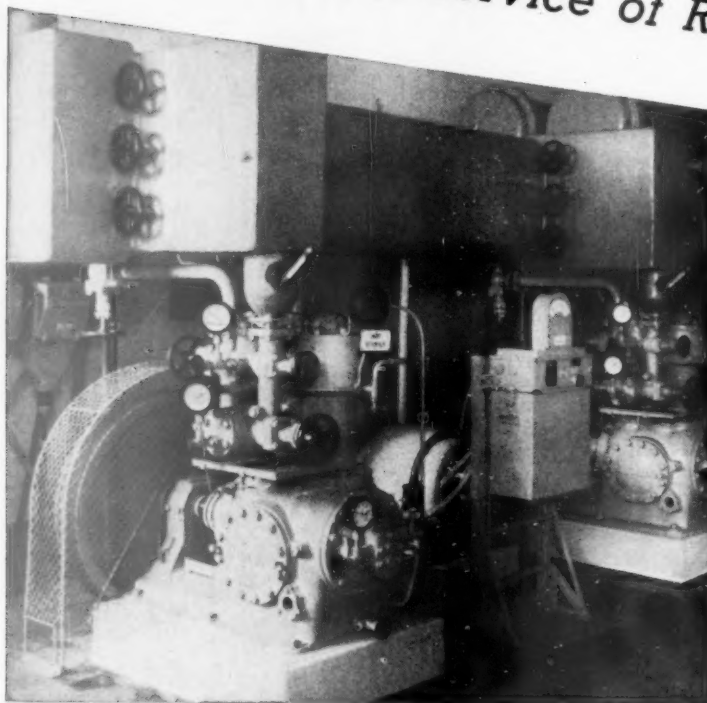
NAME.....

ADDRESS.....

MR23

From Insulation to Installation

A Complete Service of Refrigeration



- ★ **COMPRESSORS**
Single or two stage
- ★ **CONDENSERS**
Shell and Tube or Evaporative
- ★ **INTERCOOLERS**
- ★ **EVAPORATORS**
Plain pipe
Finned pipe
Shell and Tube
Submerged type
Flooded, etc.
- ★ **LIQUID AMMONIA PUMPS**
- ★ **INSULATION AND COLD ROOM DOORS**
for all Cold Storage and low temperature work

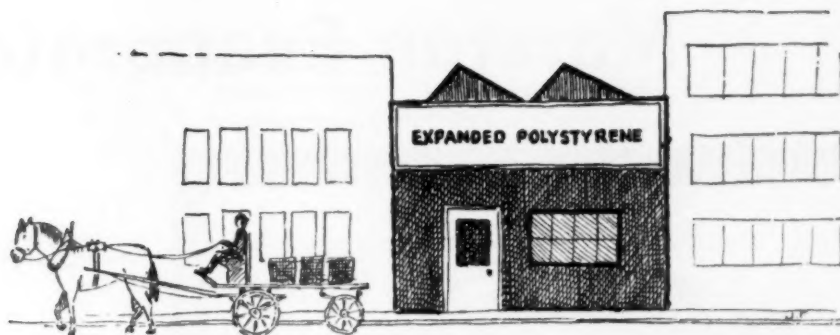
At some time you will probably have experienced the bother of buying plant piecemeal in which case you will know the extra worry which this can cause on top of everything else.

William Douglas & Sons Limited are in the position of being able to provide both plant and insulation themselves with their own staff on both sides. Behind this they have a solid foundation of experience in both kinds of work and above all the experience of putting the two together.

Why not save yourself that extra worry by asking Douglas to give you a complete *Service of Refrigeration*?

DOUGLAS

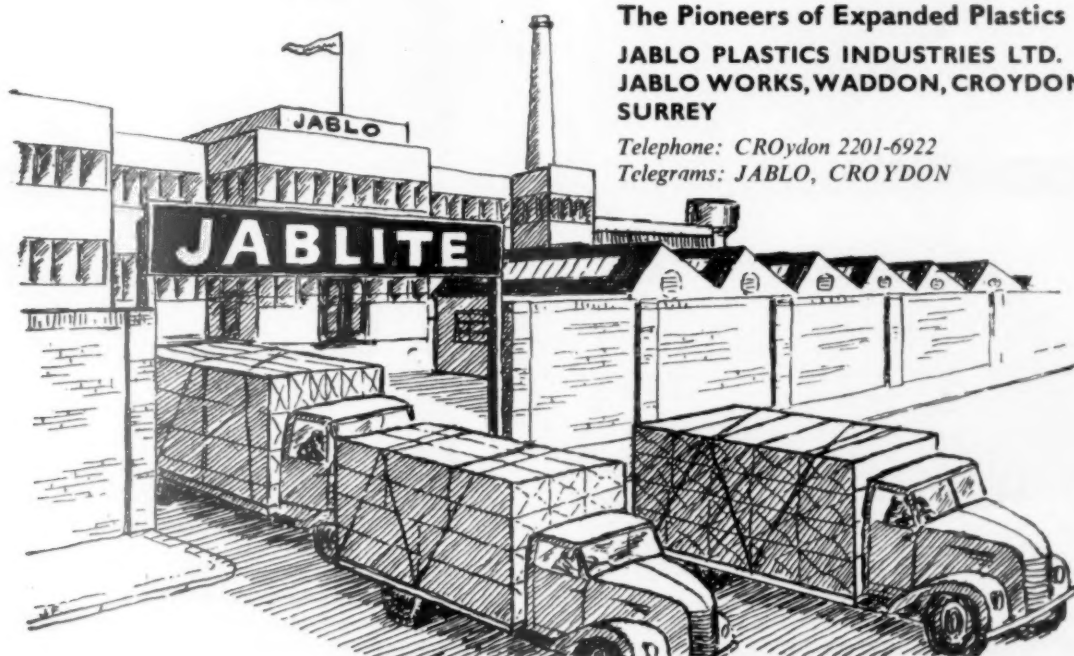
**WILLIAM DOUGLAS & SONS
(ENGINEERING) LTD.**
BREWHOUSE STREET • PUTNEY
LONDON • S.W.15
Telephone : PUTney 9221
A MEMBER OF THE BAKER PERKINS GROUP



If you are one of the FEW . . .

who are still asking for expanded polystyrene while so MANY are specifying JABLITE, you will join them after your first trial with Jablite, because of the unrivalled advantages which Jablite offers.

- * Consistency of density and maximum insulation values.
- * The only expanded polystyrene obtainable promptly against orders in largest volume of blocks and boards in all sizes up to 12' x 4' x 13", at the RIGHT PRICE.
- * The largest and most versatile capacity of foamed plastics in Europe, supported by fifteen years continuous experience.
- * You are relieved of storage problems. We supply as and when required at shortest notice . . . and accept your offcuts.



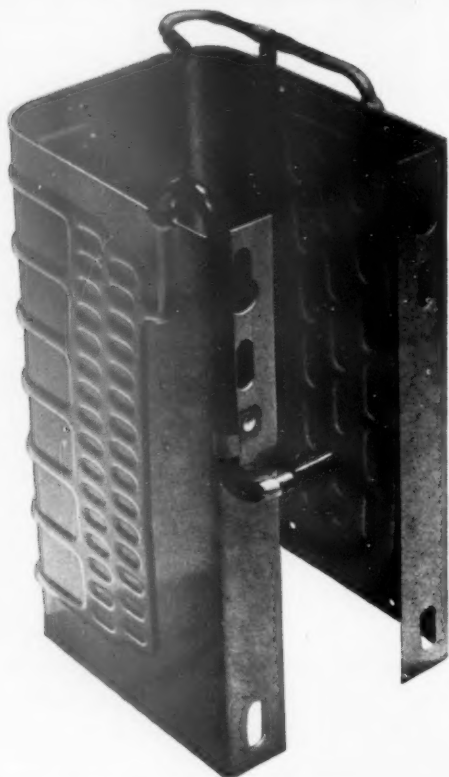
The Pioneers of Expanded Plastics

**JABLO PLASTICS INDUSTRIES LTD.
JABLO WORKS, WADDON, CROYDON,
SURREY**

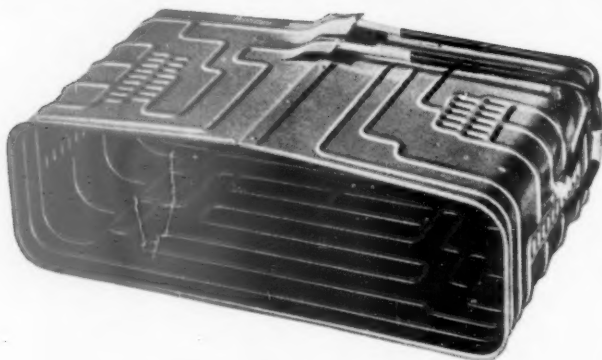
Telephone: CROydon 2201-6922

Telegrams: JABLO, CROYDON

Marston Evaporator Units



Light alloy roll-welded evaporator units offer many advantages: superior performance, light weight, attractive appearance, flexibility of design, competitive prices. A production line specially equipped for the fabrication of these units is operated by Marstons, specialists in heat transfer for sixty years. Why not discuss your design and production problems with them?



Marston Excelsior Ltd.,
a subsidiary of Imperial Chemical Industries Ltd.
Armley Road, Leeds 12.
Telephone: Leeds 63-7351

MAR. 292

Housewives
welcome
cool
clean

STYRON

Polystyrene



Ten years ago, Styron Polystyrene started a quiet revolution in refrigerator manufacture. Today it continues - bringing a clean cut elegance to design, reducing refrigerator bulk, cutting production costs by one-piece forming. Complex vacuum-moulded inners and door liners, as well as moulded strips, trims and containers for food - all in Styron - are now a feature of many modern refrigerators. This is an achievement to be proud of.

For more information about Styron Polystyrene, please write for Booklet No. 211

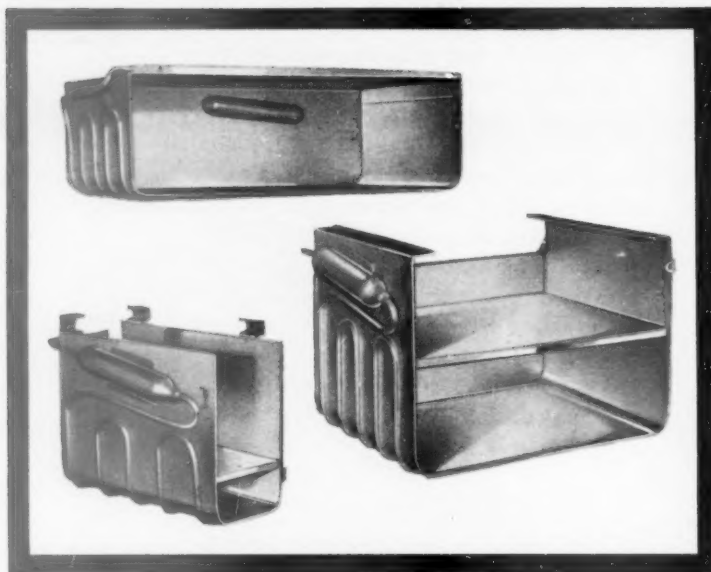
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A COMPANY IN THE
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ALUMINIUM EVAPORATORS

Manufactured by an ingenious and economical process ensuring **CONSTANT VOLUME**, which **EVAPORATORS LIMITED** have developed and proven over several years of service.

ANY SIZE MADE TO ORDER

and over 20 standard models available to meet immediate requirements

Aluminium has demonstrated its superb qualities in many amazing ways but nowhere has it been put to use more compatible with its unique qualities than in this appliance.

Aluminium Evaporators are lighter in weight, have better heat transference, will neither rust nor flake.

It must also be noted that Aluminium has wonderful hygienical properties where safe food storage is of the utmost importance.

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Model No.	Width	Height	Depth	Remarks
EL 108	10"	9"	12 $\frac{1}{8}$ "	Refrigerated Shelf
EL 173	6 $\frac{1}{2}$ "	9"	11 $\frac{1}{8}$ "	Loose Shelf
EL 440	6 $\frac{1}{2}$ "	9"	11 $\frac{1}{8}$ "	Refrigerated Shelf
EL 360	20 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	12 $\frac{1}{8}$ "	Refrigerated Shelf
EL 570	16 $\frac{1}{2}$ "	10 $\frac{1}{8}$ "	1	Refrigerated Shelf
EL 266	16 $\frac{1}{2}$ "	10 $\frac{1}{8}$ "	13"	No Shelf
EL 177	6 $\frac{1}{2}$ "	8 $\frac{1}{8}$ "	10 $\frac{1}{8}$ "	Loose Shelf
EL 1020	8 $\frac{1}{8}$ "	5 $\frac{5}{16}$ "	10"	No Shelf
EL 420	12"	10"	12"	Refrigerated Shelf
EL 730	9 $\frac{1}{2}$ "	2 $\frac{3}{8}$ "	9 $\frac{3}{32}$ "	
EL 114	9 $\frac{1}{8}$ "	8"	12"	Loose Shelf
EL 435	9 $\frac{1}{8}$ "	8"	12"	Refrigerated Shelf
EL 128	6 $\frac{1}{2}$ "	7 $\frac{7}{8}$ "	10 $\frac{1}{8}$ "	Refrigerated Shelf
EL 386	6 $\frac{1}{2}$ "	7 $\frac{7}{8}$ "	10 $\frac{1}{8}$ "	No Shelf
EL 129	18 $\frac{1}{8}$ "	5 $\frac{3}{8}$ "	12 $\frac{1}{8}$ "	Refrigerated Top
EL 122	22 $\frac{1}{8}$ "	7 $\frac{3}{8}$ "	12 $\frac{1}{8}$ "	Refrigerated Top
EL 500	16"	4 $\frac{1}{4}$ "	13"	Open Top
EL 271	18"	6"	12 $\frac{1}{8}$ "	Refrigerated Top

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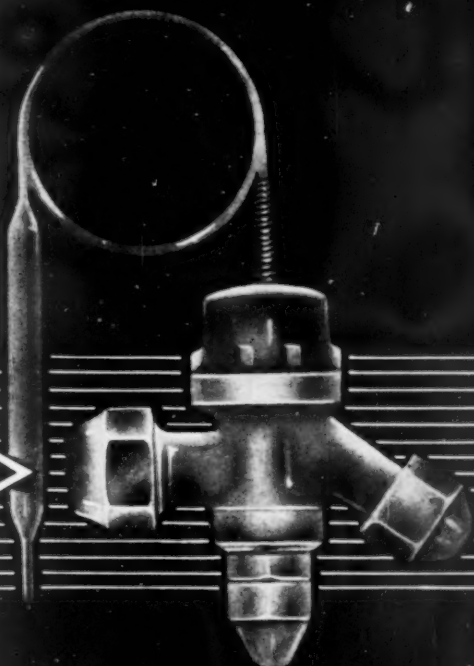
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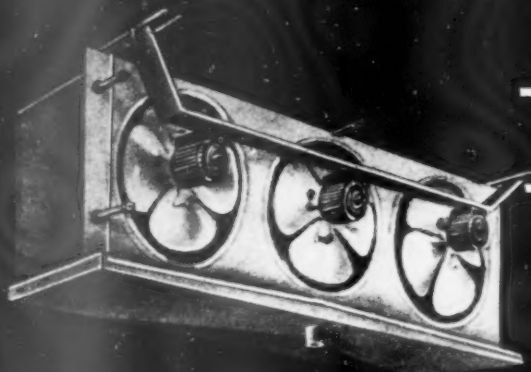
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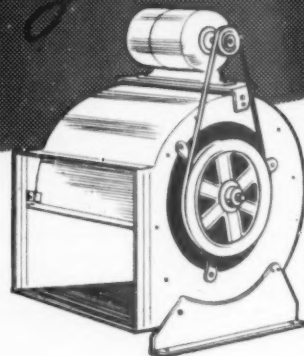
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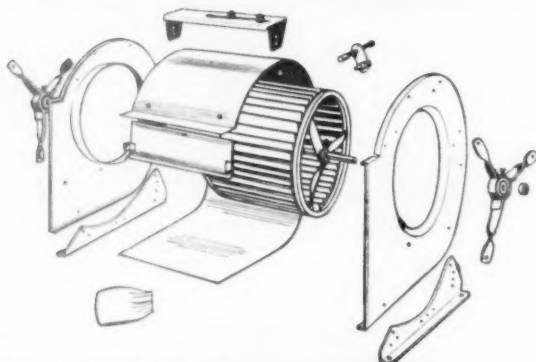
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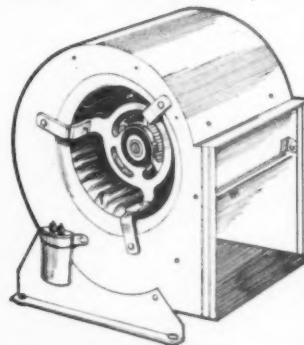
The Morrison wheel consists of two drawn steel pressed end rings with integral hubs and a one-piece blade group made from one strip of steel. This, on assembly, forms a rigid blower wheel in which there can be no loose blades.

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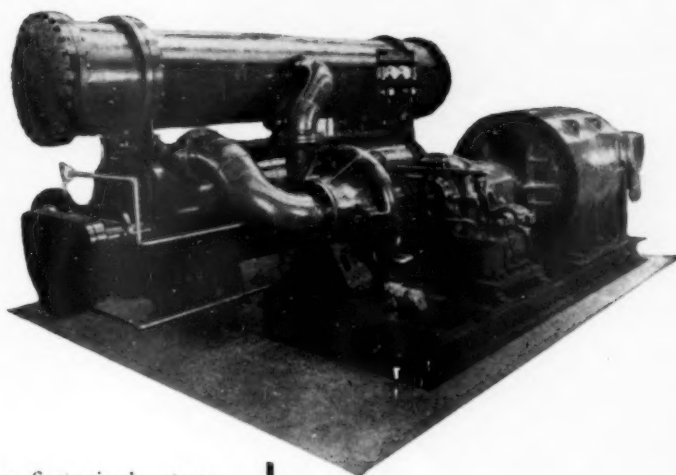
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'Darvic' wall panelling in the Bacon Chillrooms at The Letchworth Bacon Company Limited, Letchworth, Herts.

'Darvic' panelling cuts maintenance costs and improves hygiene in bacon chillrooms

This chillroom at The Letchworth Bacon Company is panelled throughout in 'Darvic' p.v.c. sheet. 'Darvic' was used mainly for its complete resistance even at very low temperatures to corrosives; particularly brine, which causes such rapid deterioration to paintwork.

Because it is also very easy to clean, cannot affect foodstuffs and it is tough enough to stand knocks that chip or scratch other forms of

panelling, it is expected to cut maintenance costs considerably. For much the same reasons, more and more meat traders—from Smithfield to the smallest family butcher—are improving hygiene and making maintenance easier with 'Darvic' panelling.

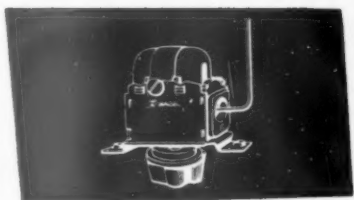
'DARVIC'

'Darvic' is the registered trade mark for the rigid p.v.c. sheet manufactured by I.C.I.

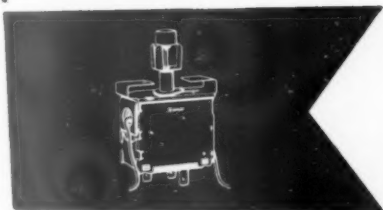


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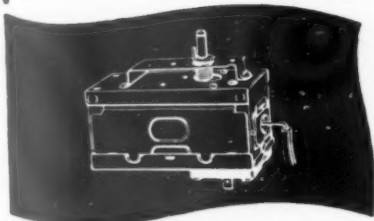
Ranco signals S·U·C·C·E·S·S



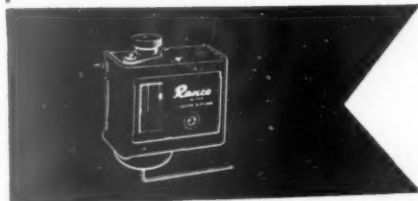
Ranco 'A' series provides a control suitable for all light and medium duty applications. The control can be made available with a single or double throw switch with various temperature ranges and differentials and in many other forms including one for operating a single or alarm circuit.



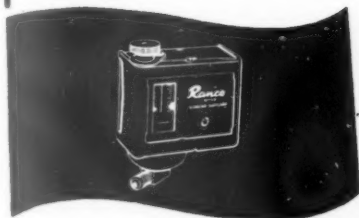
Inexpensive defrosting of domestic refrigerators is made available with the Ranco Push Button 'F' control. Combining the normal temperature control with push button defrosting the 'F' automatically re-starts the compressor after the evaporator has defrosted—returning the push button to the normal position.



Ranco 'E' series controls provide for automatic defrost of refrigerators. The defrost cycle is started at a fixed time each day and stopped at a fixed temperature or after a "time safe" period which ever occurs earliest. Available for hot gas or electric heater defrost systems. Ranco 'E' controls are used in conjunction with the normal thermostat.



Ranco 'O' series temperature controls provide a single-pole snap acting switch either closing the circuit on a rise and opening the circuit on a fall of temperature, or the reverse. The differential screw changes the CUT-OUT only on standard cooling controls: the same adjustment on standard heating control changes the CUT-IN. Graduated visible scales indicate range and differential settings.



For commercial refrigerator applications Ranco supply a very full range of pressure operated controls, in addition to the temperature operated series. These are offered in Low pressure, High pressure and dual high-low pressure ranges, and are available with various operating ranges and differentials.

The Ranco Research team is available to assist in the development of any special project or application.

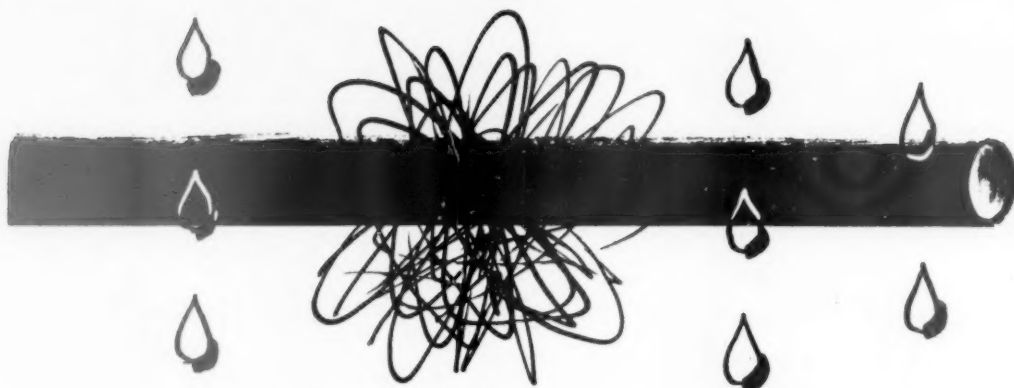


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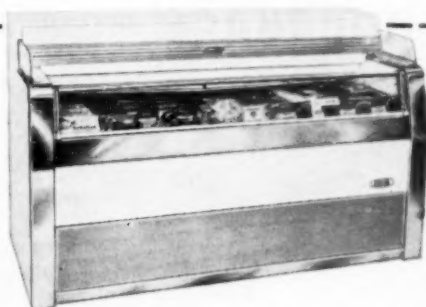


HELIFROST is the name of the new, advanced range of deep freezers and frozen food merchandisers introduced to Britain by Elektroheliös of Sweden. Leading Swedish organisation in the domestic electrical appliance field, Elektroheliös is also the largest firm in Europe producing deep-freeze equipment.

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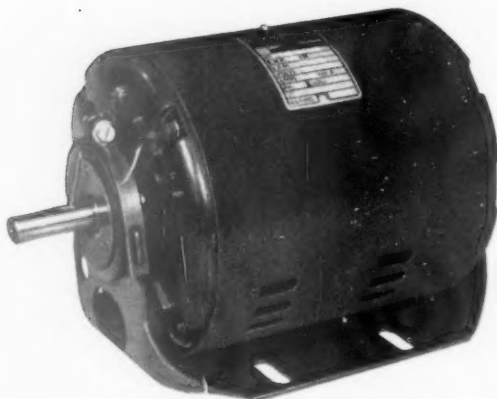
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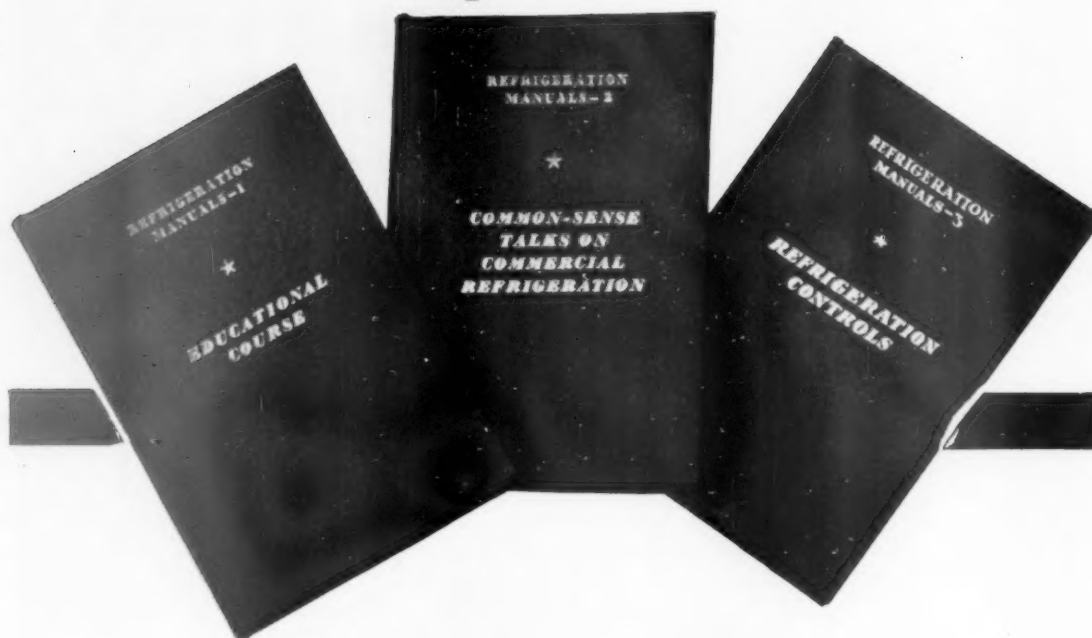
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Editorial

Comfort cooling moves in

A code for q.f.f.

Cold surgery

● Britain can be said to have moved into the "air-conditioning age." Many new metropolitan landmarks are being installed with full air-treatment plant whereas a year or two back this equipment was rarely to be found in their specifications. That famous site on which the old Gaiety once stood in Aldwych is now graced by the beautiful headquarters of The English Electric Company.

● English Electric House has an air-conditioning system installed up to the fourth floor, and this comprises a number of plants serving separate sections of the building. One plant serves the Aldwych side and one the Strand side, to allow for the movement of the sun round the building and consequent changes in temperature, a third goes to the exhibition hall which may sometimes be crowded and at others not. Separate plants for these areas give the most economical operation. Separate ventilation plants are also installed in the basement garage and the board room area. (See page 932.)

● The National Association of Frozen Food Producers has framed a code of practice which they have circulated in draft form to a score of interested parties. In submitting the memorandum, the general secretary, Mr. W. Mitchell, states: "Since the early days of the quick-freezing industry the combined interests have moved a long way towards perfection, and my council feels that the enclosed document is the best practical up-to-date recommendation. Without doubt the necessity will arise for a revision as the techniques improve and the available equipment is in total and efficiency brought nearer to the ideal. There can be no doubt that the need for such a document exists, and it is due in some measure to the requests of all interests that we, as processors, have accepted the duty of preparing the recommendations as to the best practical means of securing adequate protection for quick-frozen foods from producer to consumer."

● Those readers who saw the television thriller concerned with freezing the human body into unconsciousness will not evince surprise when they learn that in the United States recently a delicate heart operation was performed successfully on a five-year-old girl by refrigerating her to a mere 79° F and temporarily stopping the flow of her blood. By cooling her the doctors were able to cut off the flow of blood for five and a half minutes and sew up a hole in her heart between the two ventricles. The

heart had become enlarged because it was forced to pump too much blood. She was put to sleep, then wrapped in a rubber blanket through which an alcohol solution was pumped; it had been cooled to just above freezing. In two hours her body temperature had fallen from 98.4° to 81°. It dropped another two degrees before the operation was finished. After the operation the child was dipped into a hot bath. It took 40 minutes to readjust her temperature.

● Artificial lowering of body temperature has, of course, become a useful medical technique. The method has been named hypothermia. It plays a steadily increasing part in heart surgery, particularly with small children born with defective hearts, so-called "blue babies." Aneurysms of the large blood vessels (dangerous swellings of an artery due to stretching of the walls) can be operated in refrigerated sleep. Severe leg and arm wounds are being treated in the state of hypothermia, and there are advantages of the method in brain surgery. To-day, refrigeration of the body is used in many major hospitals everywhere in the world. The patients do not feel chilled. They are narcotised before the cold is turned on. When they awaken their normal temperature has been restored. A leader in this field in Great Britain is Dr. St. John Lyburn and a report on his work at Tunbridge Wells will appear next month.

● Described in typical U.S. vernacular as the "hottest new prospect in the frozen-food industry to-day" is the use of liquid nitrogen to provide refrigeration both at the processing plant and in transit. The method, being studied currently by Union Carbide Corp., Air Reduction Co., Liquid Carbonic Co. and Isbrandtsen's Liquifreeze Co., has already indicated its technical soundness. Still to be resolved is the economic attractiveness of liquid nitrogen cooling in competition with established food deep-freeze methods.

● The method of operation of such nitrogen plants is simple. Food, taken directly off the processing line, is conveyed through an insulated cabinet containing a pool of liquid nitrogen. Direct heat exchange results in rapid subcooling of the produce (less than five minutes to cool from 180° to -5° F), vaporized nitrogen is withdrawn through vents and recirculated to the liquefaction unit. Leaving the cooling chamber, the produce is conveyed to the packing line and is then taken directly to insulated railroad cars or truck trailers which are also refrigerated by liquid nitrogen.

● The nitrogen process has been demonstrated in Los Angeles in a plant producing 60 to 120 retail packages per minute, with a cooling time of two to three minutes to reach -5° F. This plant has now been purchased by a major East Coast food processor. Key to the economics of the process are the method of insulation employed in the cooling chamber and in the transit cars and the cost of liquid nitrogen. More will be written on this subject next month.

● Three commissions of the International Institute of Refrigeration, namely *commission 3* (design, construction and operation of machinery for refrigerating and air-conditioning plants), *commission 4* (applications of refrigeration to foodstuffs and agricultural produce) and *commission 5* (cold stores and ice-making plants) met in Marseilles from September 6 to 9. The subjects dealt with were as follows: *Commission 3*: Design of evaporator systems, including controls (joint session with *commission 5*); Absorption machines and steam jet systems; Industrial plants for the temperature range 100° to 200° K (-99.4° to -279.4° F); *Commission 4*: Prepackaging of chilled and frozen foodstuffs; Quality of frozen foods (joint session with *commission 5*); Cooling of cut flowers and bulbs. *Commission 5*: Cold storage guide; Design of doors for cold stores; Jacketed cold rooms. The meetings followed a "Refrigeration Session" organized by the French Association of Refrigeration in Marseilles which included some technical visits in the city and its surroundings.

● Our article on a new low temperature food van proves the point that, provided the frozen product has

been adequately processed and carefully handled from processing plant to buffer stores, with buffer stores skilfully operated and capable of low temperatures, then in the last analysis the condition of the product in the hands of the retailer rests in proper and adequate safeguards within the wholesale distributive trade, on the road. These safeguards lie mainly in holding the product in as nearly as possible the same condition as received from the processing plant.

● Bradford Council has been chided in its local Press for creating a monopoly in cold storage when they recently decided to buy for £55,000 the Bradford Clear Ice and Cold Storage Co. Ltd. in Mulgrave Street, Bradford. This old-established company was started in 1899 by Mr. William Fletcher. Since the markets and fairs committee already has a cold storage plant in St. James's Market, the deal means that the Corporation now has complete control of cold storage in the city. Arrangements are to be made for the committee to operate the works until the property is required for development purposes. The Clear Ice premises have recently been modernized and include deep-freeze equipment.

TEST CHAMBER FOR THOR I.R.B.M.

LARGEST of its kind in the world, a test chamber has been built at Edwards Rocket Base, near Los Angeles to test America's Thor intermediate range ballistic missile under accurately simulated weather conditions varying from an arctic gale to a tropical rainstorm.

To accommodate the 65 ft. long missile, the chamber was built 20 ft. by 24 ft. by 75 ft. high. With associated ducting it contains a volume of approximately 40,000 c.ft. The chamber walls are constructed of aluminum covered, paper honeycomb panels, sealed at each corner with cork. Inside are five levels for access to the liquid fueled motors (main stage and verniers), the inertial guidance compartment, and all instrumentation and airborne electronic equipment. Entry is through freezer type doors with vestibules or air-locks at each level.

To resist the intense radiant heat from an engine consuming fuel and liquid oxygen at more than 4,000 g.p.m., panels of aluminium and cement-asbestos sandwich have been added to the lower part of the chamber. Before firing, the bottom floor is rolled away, exposing a 10,000 g.p.m. water-cooled deflection plate below the nozzle. The bottom of the chamber is sprayed with water to prevent damage from the exhaust

which, in creating 75 tons of lift, generates a core temperature of 6,000° F.

Two 9 ft. by 69 ft. electrically operated doors at the front of the chamber permit installation and

DEMAND MAINTAINED FOR BRITISH-MADE DOMESTIC REFRIGERATORS

The Domestic Refrigeration Development Committee informs us that both home and export demand for British-made domestic refrigerators was maintained in July.

July deliveries of British-made refrigerators to the home market totalled 97,965, compared with 91,833 in July of last year, an increase of 6.6 per cent.

Deliveries for the first seven months of this year total 751,408, as compared with a total of 551,939 for the same period in 1959.

Deliveries of domestic refrigerators to the export market during July increased by 21.5 per cent.—a total of 11,075 compared with 9,122 in July of last year. Since January of this year deliveries of domestic refrigerators to the export market show an increase of 42.3 per cent. over the same period last year.

removal of the missile, using a gantry crane which covers the missile and apron.

Inside temperature is controllable between -35 and +165° F. Besides thermal conditioning, rain simulation nozzles on three levels permit any selection of rainfall from cloudburst to a drifting mist.

Among the many test objectives the chamber has fulfilled are:

(1) Determination of heat transfer rates between the controlled ambient and the inside of the inertial guidance components and the engine section.

(2) Determination of temperature distribution within the above areas.

(3) Demonstration of the capability of existing ground support air-conditioning.

(4) Determination of missile temperature transients when air-conditioning is interrupted.

(5) Demonstration of operating capability of airborne hydraulic, mechanical, and electronic equipment.

(6) Evaluation of operational problems and hazards of LOX (liquid oxygen) and fuel loading in extreme environments.

As mentioned earlier, design requirements for the chamber are -35° to +165° F. This span must be provided throughout an outside temperature range of 15 to 105° F. Refrigeration is accomplished by evaporating liquid nitrogen in a coil. Liquid nitrogen is supplied under its own pressure from two cryotanks with capacities of 1,000 gal. and 2,000 gal. respectively.

NEWS OF THE MONTH

Refrigeration and A-c. Exports.—During July, 1960, air-conditioning and refrigerating machinery (commercial and industrial sizes) to the value of £721,053 weighing 942 tons, was exported from the United Kingdom. Comparable figures for July, 1959, were 963 tons, worth £742,695.

Exports' Analysis.—Of the 942 tons of air-conditioning and refrigerating plant worth £721,053 exported by Great Britain in July—quoted in the preceding paragraph—57 tons went to the Union of South Africa, 25 tons to India, 133 tons to Australia, 46 tons to New Zealand, 29 tons to Canada, 202 tons to "other Commonwealth countries," 62 tons to Eire, 26 tons to Sweden, 95 tons to Western Germany, 46 tons to the Netherlands, 30 tons to Belgium, 35 tons to France, 21 tons to Italy, and 135 tons to "other foreign countries."

Refrigeration Plant Classified.—Of the total exports of air-conditioning and refrigerating machinery during July, commercial refrigerators accounted for 126 tons, worth £73,318, industrial plant and equipment for 166 tons worth £92,048,

and refrigerating machinery, equipment and parts, including parts of commercial refrigerators, for 451 tons, worth £357,296.

Exports of Small Refrigerators.—During July, 1,252 tons of complete refrigerators and domestic refrigeration equipment were sent overseas from Great Britain. These exports were worth £795,044. The 1,252 tons comprised 20 tons to the Union of South Africa, 34 tons to Rhodesia and Nyasaland, 3 tons to India, 72 tons to New Zealand, 479 tons to "other Commonwealth countries and Eire, 64 tons to Sweden, 110 tons to Western Germany, 43 tons to the Netherlands, 22 tons to Belgium, 9 tons to Italy, and 396 tons to "other foreign countries."

Ice Cream for the Potteries.—More and more people in Britain are eating more and more ice cream and to cope with the increasing demand T. Wall & Sons (Ice Cream) Ltd., are building new depots all over the country. The most recent one is at Newcastle-under-Lyme, built to replace an old depot which proved to be too small. The new depot, at Loomer Road, Chesterton, Newcastle-under-Lyme, has an area

of more than 13,000 sq. ft. The depot is capable of storing more than a week's supply of ice cream, or approximately 1,000,000 portions, for the 715,000 inhabitants of Cheshire, Staffordshire, Derbyshire and Shropshire. In addition to the cold store, there is office accommodation for Mr. H. L. Arnold, manager of the depot, and his staff of 28. A fleet of 17 vans, including some of the most up-to-date refrigerated vehicles, operates from the new depot.

Refrigeration for Mining.—Lea Hall Colliery, near Rugeley, Staffordshire, was opened on July 19. It was in the shaft sinking operations at this pit that one of the biggest known ground freezing operations was carried out in heavy water-bearing strata. It took four months to form the ice block in each of the two shafts. Eventually there will be 23 miles of underground roadways and the pit will have an annual production of 1,500,000 tons.

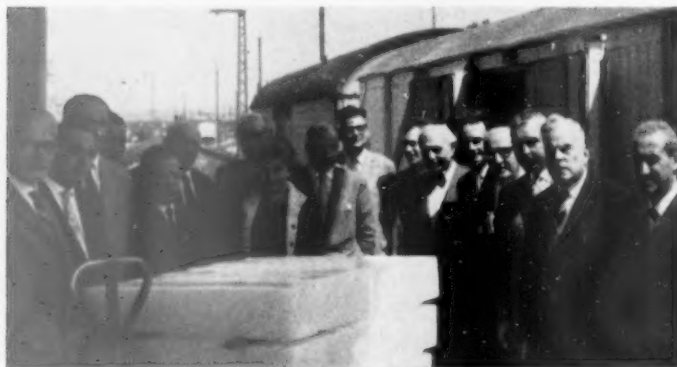
Corrosion Exhibition.—Sir Alexander Fleck, president of the Society of Chemical Industry, will open the Corrosion and Metal Finishing Exhibition to be held in the Empire

R.I.F. LICENSEES GATHERING

DEMONSTRATIONS of batch production of rapid-ice at Gebrüder Plersch, Germany, and of oil-free refrigeration compressors and their manufacture at the works of Sulzer Brothers, A.G., at Winterthur, Switzerland, were features of the 1960

meeting of licensees of Rapid-Ice-Freezing Ltd., which took place in Switzerland on July 22 to 26.

The illustration shows representatives of the licensees visiting the Basle rapid block-ice plant which produces 65 tons of ice per day for railway applications.



Present at this gathering were Dr. E. Baumgartner, the initiator of the Basle plant (immediately behind the lady in the centre of the photograph), Prof. R. Plank (2nd from right) founder of the rapid-ice theory, and Ing. E. Wilbushewich, inventor of the freezing plant.

Hall, Olympia, London, from November 29 to December 2. The opening ceremony will take place at 11 a.m. on Tuesday, November 29. The exhibition is at least twice as big as the first Corrosion Exhibition, held in 1957 and it is now probably the world's largest display of metal finishing products and services. One of the new features of this year's exhibition will be technical meetings arranged by the Plastics Institute and by the corrosion group of the Society of Chemical Industry. There will also be technical films dealing with various aspects of corrosion and metal finishing.

REPLACEMENT AIR-CONDITIONING

WHILE air-conditioning is a relatively new industry, the replacement market in some fields in the U.S. is attaining propor-

tions which should make it a considerable factor in future marketing plans of the industry, it is indicated in a recent survey by the drug trade publication *Drug Topics*, which found that 2,437 drug stores added new air-conditioning equipment in 1959, and that there were 2,340 replacements of old equipment in stores previously air-conditioned.

"Drug stores were among the first commercial establishments to install air-conditioning," it was pointed out by Geo. S. Jones, Jun., managing director of the Air-Conditioning and Refrigeration Institute, "and it is readily understandable that some of the pre-World War II equipment, and some of that installed immediately after that conflict, now is being replaced by more modern equipment which permits better control not only of temperature but of humidity and air distribution."

It is interesting to note, Mr. Jones said, that almost three-fourths of the nation's drug stores were air-conditioned at the end of 1959. The total number, according to survey, was 38,368 of the national total of about 55,000 stores.

A separate compilation, made for independents and chain stores, showed that more than two-thirds (68.7 per cent.) of the former, and almost nine-tenths (89.5 per cent.) of the latter are now air-conditioned.

Another feature of the survey of interest to the air-conditioning and refrigeration industry, had to do with their soda fountains, virtually all of which include refrigeration equipment. Installations, remodellings, and modernizations of this type of equipment were made last year in 3,035 different drug stores, according to the survey.

PICTURE OF THE MONTH



Canopies recently erected at the wharves of the Union Cold Storage Company on the Thames are new landmarks which will be seen by thousands of people every day. Inside the canopies specially designed handling gear has also been installed. The new handling equipment enables the loads to be landed from the barges direct into the main store, and will have the additional benefit of easing the pressure at times when there are a number of ships in the river waiting to unload. Shown are a new canopy and transporter at Nelsons Wharf.





New Store for Chambers Wharf

**Over half a million
cubic feet
at Walthamstow**

A NEW cold store, with a gross capacity of over 560,000 c.ft and with a ceiling height of 18 ft. 6 ins. has been opened by Chambers Wharf and Cold Stores Ltd. at Walthamstow. The building is 320 ft. long by 100 ft. wide, with loading banks across each of the shorter ends; these banks being protected by cantilevered roofs, the length overall being 398 feet. Due to the nature of the ground the whole store is carried on 388 reinforced concrete piles.

The ground floor of the store is at loading bank level in order to form a ventilated space beneath the store—and thus obviate the necessity of providing an anti frost-heave mat. A system of main precast concrete beams at 12 ft. centres was evolved during construction, these beams being supported on the pile caps and, in turn, carrying 12 ft. span precast concrete floor units which take the superimposed load of 7½ cwt. per sq. ft. The whole of this precast concrete work was made in Doncaster by a subsidiary of the main contractors.

The superstructure of the store takes the form of steel stanchions at 12 ft. centres, carrying 100 ft. span shallow steel trusses. The wall stanchions are concrete encased—for weather protection and fire resistance—and the panels between these are filled in cavity brickwork with a 3 in. continuous cavity from top to bottom, the panel being supported on twin concrete beams, in order to afford complete ventilation. At high level along the walls continuous louvre units are provided for the ventilation of the roof space. The 4 degree pitched roof is clad in asbestos cement troughing. The whole building is

split into three units by full expansion joints through all the elements of the structure.

To carry the ceiling insulation without resorting to the use of buried timbers it was decided to form a timber ceiling within the cold store, surfaced on the top with fire-resisting asbestolux board. The whole of the ceiling timbers were fabricated in the main contractor's joinery works, but assembled on site. The ceiling structure was slung from the roof trusses by means of laminated plastic strips. For the sake of decoration, and for the other obvious



The site looked rather like a battlefield when entered by the main contractors.

The work of pile-driving begins.



reason, the whole of the exposed ceiling timbers were treated with white fire-retarding paint.

Insulation

A system of complete envelope insulation was adopted for the store. The vapour-seal to the inside of the walls consisted of a coat of bituminous emulsion, embedded on which are sheets of aluminium foil. The wall insulation consists of 9 in. of cork in three 3 in. layers, the first layer being hot bitumen, the subsequent layers in sand and cement. The internal face is finished in cement render, decorated with Snowcem, and protected by dunnage battens.

The floor vapour-seal consists of two coats of asphalt on which was laid 8 in. of cork in two 4 in. layers in hot bitumen, the cork being finished with $\frac{1}{4}$ in. thick reinforced granolithic. Ceiling insulation is of two 4" layers of expanded polystyrene, laid on top

of the asbestolux sheeting, and joined in a low melting point bitumen. The vapour-seal on top of the insulation is of bituminous emulsion, and on top of this a $\frac{1}{4}$ in. reinforced Indasco render is laid as a walking surface for roof maintenance purposes.

The store is divided into three chambers by insulated partitions built up with timber studding and cork insulation. The main doors, both to the cold stores and in the partition, are 6 ft. wide by 12 ft. high; the external doors are of the Super-freezer type, with heaters to prevent ice build-up; the doors in the partitions are sliding doors with a wedged seal at the jambs. In addition, smaller personnel doors are provided at each end of the store. The external doors are fitted with Miniveils and in view of the exposed nature of the loading banks these, to reduce air transfer, are being supplemented with air-lock doors or curtains.

Mechanical handling is practised in these chambers which are very lofty.



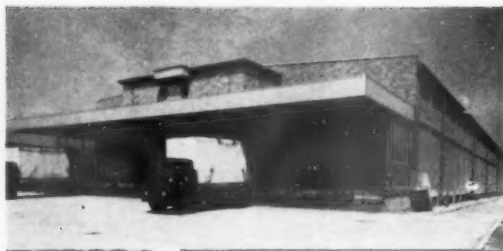
Refrigeration Plant

An engine room is sited alongside the cold store at a point where this is permitted by site width. It is equipped with three Sterne 65 h.p. 3 MAC compound compressors, with liquid pre-cooling, running at 450 r.p.m. The engine room is lifted to bank level in order not to obstruct ventilation beneath the cold store.

Three 24 in. diameter by 12 ft. shell and tube condensers are sited on a mezzanine floor at one end of the engine room. These condensers operate in conjunction with a film cooling tower which is sited above a large open reinforced concrete water



tank on the roof of part of the engine room. Ammonia circulation by two William Douglas and Sons' Pumps is made to six special finned evaporators located in three cooler rooms. These cooler



rooms are sited one over each loading bank, the third above part of the engine room, and each serves one of the cold store chambers, though provision is made for some inter-connexion. Air distribution throughout the chambers is through ceiling ducting, the air being delivered into the ducting via 38 in. Aerofoil fans.

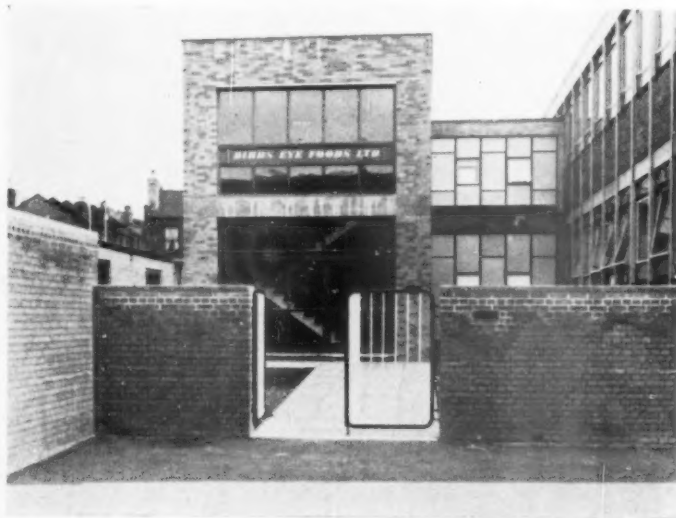
The plant is fully automatic, including the defrost cycle, and is controlled from a central panel manufactured by Pulver & Co. Ltd., and sited in the engine room. The room temperature is controlled by Honeywell Brown electronic panels, governed by room thermostats. Defrosting is effected by hot gas and water sparge; electric heating being incorporated in the cooler trays. The water for this purpose is, in the case of one cooler room, from the tank below the film cooler and, in the case of the other two cooler rooms, from tanks beneath the loading banks which are provided with electric immersion heaters, and from which the water is pumped up to cooler room level.

The plant is designed with one item of the principal parts of the equipment as a standby; the electricity supply is brought to the engine room through duplicated cables from a new transformer chamber erected at one end of the site.

The store was designed principally for the holding of pre-frozen produce in the temperature range of zero to minus 10°F.

One of the chambers in the store, which has a

Top right: One of the two very ample loading banks protected by cantilevered roofs. Above: A chamber with palletized cases of food. Right: A separate office block on the site has been provided for a leading food processor.





Another view of the office block used by a food processor.

capacity of over 100,000 c.ft. is used by Birds Eye Foods Ltd., for the sorting and breaking down of pallet loads in order to build up full van loads of assorted goods for distribution by road. For this purpose two steel mezzanine floors were formed in this chamber, together with a conveyor and chute system.

The lighting throughout the cold stores and on the loading banks is by fluorescent fittings. To enable operatives to evacuate the store in the unlikely event of a complete power failure, signs are being provided above doorways, together with direction arrows in gangways. These signs are self-luminous, the isotope Krypton 85 being used in them to excite special phosphors. It is anticipated that these signs will give light for a number of years without the necessity of maintenance.

Two-Storey Office Block

A two-storey office block, adjacent to the store, is approximately 101 ft. long by 46 ft. wide, with a unit containing the entrance hall, staircase, and toilet accommodation, joined to it by means of a fully glazed link. The ground storey contains, apart from some office accommodation, canteens for both cold store and office staff, together with a small kitchen, locker rooms for drivers and cold store staff, together with toilet accommodation for this staff. The first floor is entirely office space sub-divided by demountable glazed metal partitions. The majority of this block is heated by means of a direct response electric underfloor warming installation. To conserve energy the windows are double glazed and a high standard of thermal insulation provided throughout.



To reduce noise level, as well as giving thermal insulation, the ceilings in the offices are finished with an incombustible acoustic tile. The heating of these offices is linked to the main electrical control panel in such a way that the office heating is cut off should the full refrigeration load be required at any time, though it is unlikely that the peak refrigeration load will ever coincide with the time of the peak heating load.

In addition to the main office block a small building is erected at the western end of the site, and this contains, apart from offices, a mess room and toilet accommodation. A separate building is provided and is equipped for the charging of electric fork-lift trucks. A further building was erected for the purpose of washing vehicles used for road distribution purposes.

History of the Project

The project at Walthamstow was first considered when a large site used as a car-breakers yard was purchased. Application was made for consent to the erection of the cold store and other buildings towards the end of November, 1958. Planning permission was not granted until mid-February 1959, and work commenced on the site on the 2nd March, 1959, some advantage having been taken of this waiting period to do a certain amount of re-planning.

Work having commenced at the beginning of March 1959 the whole of the piling of cold store and office block was completed before the end of April 1959.

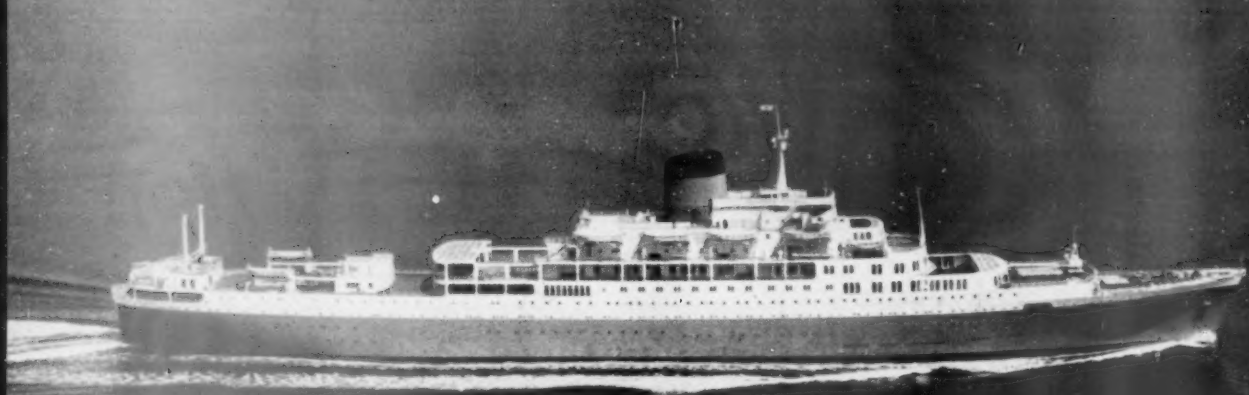
By the beginning of May 1959 the whole of the structural steelwork and roof trusses had been erected, and the main precast concrete floor beams had been positioned, and about 50 per cent of the floor units were in place.

Towards the end of May 1959 the insulation contractor commenced work on site.

The refrigeration contractor commenced plant installation in July 1959, and cooling down of the two larger chambers was carried out during the latter part of October 1959.

Work on the erection of the precast concrete framework of the two-storey office block commenced

(continued on page 949)



R.M.S. "WINDSOR CASTLE"

THE profile of Union Castle's new 38,000-ton *Windsor Castle* has departed from the yacht-like elegance of the Stirling/Athlone/Capetown series, with a height of 86 ft. from bridge to load line. The interior design and *decor*, however, represent, in the opinion of the writer, the greatest advance in marine passenger comfort, both physical and aesthetic, made in the last quarter of a century. *Windsor Castle* is, indeed, the ship of the year.

This twin-screw turbine vessel was built and engined by Cammell Laird & Co. (Shipbuilders & Engineers) Ltd., for the Union Castle Mail Steamship Co. Ltd., under the survey of the Ministry of Transport and Lloyd's Register of Shipping.

The following are the principal statistics relating to her:—

Length over-all ...	783 feet
Length B.P. ...	730 "
Breadth moulded ...	92 "
Depth moulded ("C" Deck) ...	50 "
Draught maximum ...	32 "
Height—load line to navigating bridge ...	86 "
Gross tonnage ...	38,000 tons

Number of passengers

First class ...	191
Tourist class ...	591
Interchangeable	50 first
First class or	class or
Tourist ...	100 tourist
	class
Crew ...	475
Maximum number of persons on board ...	1,357
Service speed ...	22½ knots
Shaft horse-power ...	45,000

In addition to having two promenade decks, boat deck and bridge deck, there are four complete steel decks, with an orlop deck and lower orlop deck fitted forward and aft of the machinery space, aboard *Windsor Castle*.

Twelve main watertight bulkheads divide the hull into 13 main compartments and, in conjunction with these bulkheads, the hull and superstructure are subdivided into a number of fire-resisting zones with specially insulated fire-resisting bulkheads.

Cargo is carried in seven holds and associated 'tween decks, three of which are forward of the main machinery space and four aft.

Numbers 1, 2, 7 and 8 lower holds are arranged for general cargo and the remaining holds and 'tween decks are arranged for refrigerated cargoes of fruit. Several of the refrigerated spaces are suitable for chilled meat and frozen produce, and a number of chambers are arranged for ultra-low temperature cargoes.

The hatches to no. 1 and no. 2 holds are served by a 2-ton deck traversing crane and no. 8 hatch is served by two 10-ton derricks each with an electric cargo winch. The remainder of the hatches will be served by shore cranes.

The refrigerating machinery for the cargo spaces and air-conditioning plant is arranged on the tank top abaft the engine room, and cooled brine is circulated to the various cargo spaces which are fitted with fans and battery-type air coolers.

The temperature of the air-conditioned accommodation is maintained by brine which is circulated to the heat exchangers in the various fan rooms.

Power is distributed from the main switchboard to 16 masterboards which are situated throughout the

1st-class smoking room wherein a pleasant atmosphere is maintained by air-conditioning.



vessel in accommodation and machinery spaces. The masterboards are electrically divided into various systems such as lighting, machinery space auxiliaries, refrigerating machinery, deck machinery, air-conditioning, galley, or pantry equipment as required. Where necessary these boards also supply section boards which are similarly divided. The installation also comprises machinery room, refrigerating plant and deck auxiliaries.

Electrical distance thermometers

are fitted throughout the cargo holds and give indication in the refrigerating machinery compartment.

The main refrigerating machinery supplied by J. & E. Hall Limited comprises eight 230-h.p. eight-cylinder veebloc compressors and one six-cylinder 75-h.p. compressor operating on Refrigerant-12. Two of the large machines deal with fruit and meat cargo spaces, provision rooms, cold cupboards, fresh-water cooling and ice making; five work on air-conditioning—to cool 3,500 g.p.m.

of brine to 45° F., meeting a demand of 10,500,000 B.t.u. per hour—which leaves one machine to act as standby for cargo, or air-conditioning, or to assist the other two machines when cooling down a full cargo of fruit. The six-cylinder machine deals with low temperature spaces.

The total capacity of the 14 fruit spaces is 322,580 c.ft., and of the two meat spaces 57,250 c.ft. The total capacity of the provision chambers is 25,560 c.ft. There are six low temperature cargo spaces having a



The setting of this delightful swimming pool is in keeping with the high standard of amenities to be found everywhere in this ship.



The library is the most conventional room in the ship—it is pine panelled in the French provincial style—a smoky pine.

capacity of about 23,700 c.ft. and five low temperature provision rooms of 5,260 c.ft.

The spaces are cooled by air circulation over brine-cooled batteries and through the spaces except for the ice cream room which is cooled by brine grids fitted on the roof and sides.

Eighteen insulated cold cupboards for various purposes—butter's shop confectionery and ice cream room, pantries, galleys, bars, etc.—are all brine cooled.

Six independent Hallmark units with insulated cupboards or cabinets for beer drum and bottle cooling have been fitted in bars situated on various decks.

Three Hallmark automatic ice makers, each capable of manufacturing over 8,000 ice cubes (375 lb.) per 24 hours, 272 cubes each weighing $\frac{1}{4}$ oz. being formed in a batch time of approximately 45 minutes, have been installed in the first-class pantry, first-class and tourist-class fruit and salad serveries.

Seventeen Electrolux refrigerator cabinets are installed in various pantries, etc.

The lifts installed on board *Windsor Castle* have been manufactured and erected by J. & E. Hall Ltd., and are of the latest design for the service of passengers, kitchen staff and heavy goods.

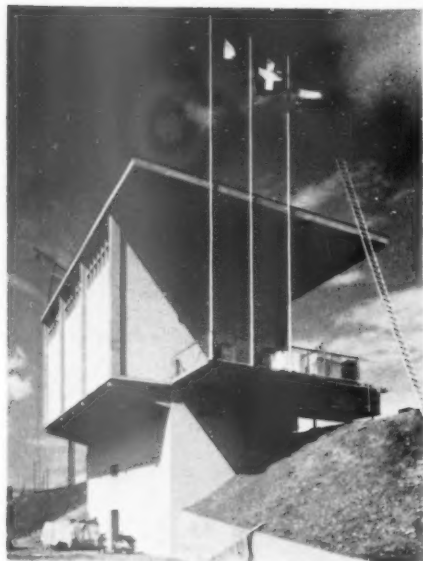
There are four lifts for passengers only, serving between 5 and 7 decks, each with a carrying capacity of 12 persons; a small lift carrying four persons, or goods, has been installed to serve six decks. Of the remaining three lifts are two for the transport of goods with a capacity of 4,480 lb. each and the small 784-lb. lift is for pantry work serving seven decks.

A 40-in. escalator has been fitted for passenger service from D to E decks, and this is capable of carrying 7,000 persons per hour at a speed of 90 ft. per minute.

The contractors for the air-conditioning plant in *Windsor Castle* were Thermotank Limited.

Aft of the funnel are the fan rooms for the air-conditioning system.





Re-Icing European Insulated Transit Wagons at Basle Railway Yards

THE re-icing of refrigerated wagons for transporting perishables has always been a great problem. As often as not, their ice-bunkers vary considerably in size and, even more, in position: The trap-doors may be found practically anywhere—in the roof, in the side walls or even the end walls. This difficulty is only too apparent when trainloads with dozens of refrigerator wagons of various types arrive for re-icing at an international transit station. Clearly, such a state of affairs makes fully mechanized re-icing in the usual sense virtually impossible.

These considerations weighed upon Dr. E. Baumgartner, a well-known practical expert in the field of refrigerated rail transport, when he decided to install at Basle a large Rapid block ice plant of the latest type with a 65 t./24 hour capacity. As director of the Entrepôts Frigorifiques de la Gare de Basle, S.A., Dr. Baumgartner has been, for a good many years, responsible for the re-icing of refrigerator wagons passing through Switzerland. At Basle trains arrive day and night—often with only half an hour's stopover—and he therefore needed a plant capable of producing a generous supply of ice at all times, especially during the peak season. This demand is only to be expected at such a major international railway centre: Via the St. Gotthard tunnel Italian fruit and vegetables must reach Germany, Belgium and Scandinavia while in the opposite direction fish and meat transport travel southward from Northern

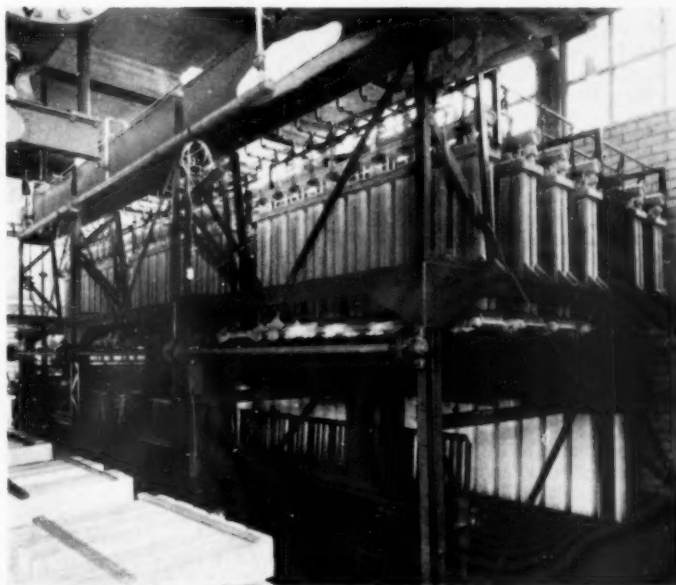
Europe. At the Basle railway yards they meet goods traffic with perishables from Yugoslavia and Greece in transit for France and England. No wonder, therefore, that in summer the peak demand often exceeds 250 tons per day whilst in winter re-icing is obviously not needed.

In the present state of refrigeration technique it would take a bold man to guarantee the uninterrupted

working of any built-in refrigeration plant, especially in those wagons which criss-cross Europe for many months without maintenance. Finally, it must not be forgotten that the keeping qualities of many foodstuffs depend as much on the right amount of humidity as on the low ambient temperature.

All these considerations combine to create an increasing demand for re-icing all refrigerator wagons, and

Above left: Rapid-Ice plant (capacity: 65 tons/24 hr.) at the Basle railway yards. Below: Motorized receiver platform carrying a row of 30 25 kg. ice blocks, simultaneously harvested, prior to being moved against the motorized tipper.



at Basle the solution called for the use of locally manufactured block-ice. In order to satisfy an annual demand in excess of 15,000 tons block ice required for more than 20,000 wagons—which statistics show as passing through Basle every year—the efforts of all ice manufacturers in and around the town had to be enlisted. Needless to say, to organize this considerable supply, equivalent of 200-250 tons per day², proved an increasingly difficult task for the Entrepôts Frigorifiques de la Gare de Basle, S.A.

In the end, the constantly rising demand made it imperative to commission the construction of an entirely new block-ice plant, to be housed in specially designed premises. This building of quite novel construction was erected at Basle railway yards (within a stone's throw of the German frontier) directly adjacent to the tracks (fig. 1). The whole project, commenced in March, 1960, was completed in record time three months later. In June, therefore, it was possible to open the plant officially with gratifying publicity and, above all, in time for the peak season.

The choice of the Rapid-Ice system as the ice generator was backed by 200 such block-ice installations throughout the world. Rapid-Ice plants produce super-cooled ice blocks, require only one-sixth of the floor area and consume only a fraction of the power required by conventional brine generators, whilst they incorporate a much higher degree of mechanization. These features and other important improvements, detailed below, have been developed and patented during the last 10 years by the Rapid-Ice-Freezing A.-G. of Zurich, who also supervised the whole Basle scheme from inception to exceptionally effective execution.

The Rapid-Ice generator at Basle comprises a total of 210 moulds for 25 kg. ice blocks of standard size each, arranged in seven rows of 3 by 10 mould-batteries. For easier harvesting the moulds are slightly tapered ranging from an upper cross-section of 6½ in. by 6½ in. to 7½ in. by 7½ in. at the bottom. Five internal evaporators, commonly known as "fingers" (slender tubes of ½ in. diameter) range axially throughout the length of the mould. They communicate with the mould-jacket evaporator so that the refrigerant circulates during the freezing period whilst hot gases free the ice blocks during defrosting. A special feature of these moulds is individual bottom flaps, made from

aluminium, effecting a watertight seal against the bottom flange as soon as their surface moisture has turned into a film of ice. These hinged flaps ingeniously open by themselves when they are forced away as a result of the expanding ice blocks on completion of moulding. Thereupon defrosting and harvesting can commence.

The patented cycle of operation according to the "Rapid-Ice" system is completely continuous. All the batteries are part of a successive freezing/defrosting cycle. Whilst six of them are, at any one

porated in the design of new plant. The Basle installation, for instance, gives for the first time outstanding and large-scale proof of theoretical work of Prof. Dr.-Ing. R. Plank³, who maintained that by reducing the thickness of the jacket space, i.e. thinning down the NH₃ envelope, the freezing period could be noticeably shortened,—to 1 hour 30 min. at 1.4° F., and 1 hour 55 min. at 14° F. To combine the practical need for rigidity with the theoretical requirement of a 3 mm. space, the evaporator jacket for each mould was sectionalized vertically,



One of the European refrigerator wagons which are re-iced day and night from the Rapid-Ice plant.

time, in circuit with the condenser, the 7th is in the process of being defrosted. During defrosting—which takes no more than two to three minutes—this battery receives the hot gases directly from the compressor, i.e. the heat being directly derived from compressing the refrigerant after it has passed through the remainder of the ice moulds. Clearly, therefore, the battery in the defrosting stage acts like a condenser and, lying in parallel to the condenser proper, substantially enhances its efficiency. Thus, the supply of block-ice is also continuous and the harvest of one battery—a batch of 30 ice blocks—is shown in fig. 2, 'being wheeled directly from the ice generator into a refrigerator wagon.

Constant progress based on the best scientific practice being the keynote of Rapid-Ice freezing, every worthwhile development is incor-

porated in this way an even layer of NH₃ around the mould is guaranteed without loss of essential strength in construction.

This detail, incidentally, becomes evident from the illustration only due to the fact that the moulds had to remain so far without thermal insulation: owing to pressing seasonal ice demands, this work has been deferred until the coming winter. It is all the more noteworthy that even in the present uninsulated state, the Basle plant attains a continuous capacity of 60 tons per 24 hour at average evaporator temperature of 10.4° F. However, after due insulation a constant output of 70 tons per 24 hour at 1.4° F. can confidently be predicted.

In this railside plant all controls are so conveniently and compactly sited that only one attendant is required to operate the

whole of this 60 to 70 ton plant, since both the receiving platform (conveying the ice blocks to the tipper) and the tipper itself (which, in turn, transfers them onto the transport trolley) are completely mechanized. The electrical main controls consist of an ingenious multi-way valve per battery whereby a 90° turn effects the changeover from freezing to defrosting, whilst the receiving platform is brought directly underneath the battery for harvesting and then moved towards the tipper by automatic press-button control.

In Basle, the generator takes up an upper floor—with a space requirement hardly exceeding 460 sq. ft.—practically level with the tracks, so that the transport trolley can be readily wheeled from the loading ramp straight into the waiting insulated wagon. The lower floor of the building houses a 150 h.p. motor driving a completely self-regulating, oil-free "Sul-

zer" compressor (fig. 5) with data as follows:—960 r.p.m., Bore:—320 mm. (1st stage) and 205 mm. (2nd stage). Stroke: 105 mm. Evaporation temperature 1.4° F. Liquefying point:—81.5° F. Cooling capacity:—1,200,000 B.t.u./hr.

So far, overall consumption figures—which include the power needs of the water pump for the condenser show that the uninsulated plant demands only 44 kW per ton of ice generated. When the insulation of the plant has been completed, it is estimated that consumption will be lowered to less than 40 kW. These low figures represent a significant advance in the technique of ice generation.

In order to permit a continuous maximum flow of ice blocks during the peak season whole train loads of storage wagons are successively drawn up past the ramp day and night, to be loaded with batches of ice blocks. They are then shunted to the adjacent tracks to the perish-

able food transport await re-icing while being marshalled in transit.

Three flags surmount this new and rather unique building. As may be expected, the Swiss flag takes pride of place in the centre, flanked by two national flags which are changed with arrival of every incoming refrigerated train transport, corresponding to the countries of origin and destination. Surely, they are also an apt symbol for INTERFRIGO, the international organization responsible for the re-icing of European refrigerated transport by railway, which made Basle their obvious choice for headquarters.

References—

¹E. Baumgartner: The Inst. of Refrig. Bulletin, MODERN REFRIGERATION, June, 1960.

²Basler Nachrichten No. 328/1960.

³R. Plank: Kältetechnik, Band 11, 1959.

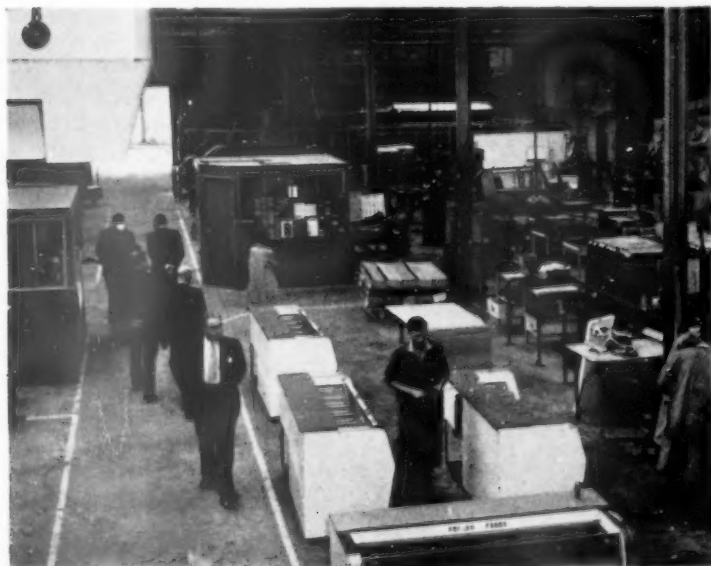
AERO PIPE'S NEW FACTORY

The spacious new premises of Aero Pipe and Glass Co. Ltd. at Yiewsley, Middlesex, were officially

opened recently by Mr. Charles Curran, the local Member of Parliament, who was received by Mr.

W. O. Julius, managing director, Mr. Brown, sales director and Mr. F. E. Gartside, director and secretary. A tour of the factory soon revealed how throughput has been aided by this move to these premises which are close to London Airport.

The well-known top-selling A.P.G. lines of commercial storage and display equipment were seen in various stages of manufacture; these items included the service chiller cabinet, the 105 frozen foods



A view of the Yiewsley factory.

sales case, fitted with automatic electric defrost, the dual temperature cabinet, and the 45-c.ft. mobile cabinet. The very latest Ransburg paint plant created considerable attention.

In addition to their own lines of manufacture, Aero Pipe produce many pieces of equipment for the leading makers.



Sylvania's new radio-tube plant at Altoona, Pennsylvania, air-conditioned by the Carrier Corporation.

Air-Conditioning in Industry

FACTS AND FIGURES—EFFECTS ON PRODUCTION

From Our New York Correspondent

THERE is no doubt that air-conditioning in industry brings up productivity and brings down personnel turnover, errors and absenteeism. But how high is the increase and the decrease? The General Services Administration which operates all the U.S. Government's buildings, has made a survey to find the answer to this question. Tests were run for five months and the percentages reported by the G.S.A. are: 9.5 per cent. increase in work production; 0.9 per cent. decrease in errors; and a 2.5 per cent. decrease in absenteeism; a measurable increase in employee health and decrease in employees' living expenses (less cleaning bills, less make-up required, etc.).

The 9.5 per cent. increase exceeded all expectations of the G.S.A. "We know," they stated, "from our previous studies, that a seven-minute saving in time per employee per day will more than pay for the expense of an air-conditioning system. In other words, if work production increases only 1.5 per cent. per year, the system will pay for itself through savings in salaries."

Here are a few other, even more optimistic results of industrial air-conditioning:—

An 80 per cent. drop in maintenance costs in a nylon hosiery plant.

A survey of 75 manufacturing plants in the New York City area showed a 25 to 30 per cent. drop in absenteeism.

The Aluminium Co., of Canada, reported a sharp drop in turnover rate and absenteeism.

A 25 per cent. decrease in overtime as reported by the Elgin National Watch Co.

The Detroit Edison Co. found that without air-conditioning it took 5,008 man-hours to produce 8,988 work units. With air-conditioning 10,474 work units required only 3,872 man-hours—the efficiency was almost doubled.

What Does it Cost?

Here is a practical rule of thumb to find out approximately the costs of air-conditioning an entire plant, as calculated by the Carrier Corporation in New York. Take

the gross annual wage for your plant and divide it by four. Then take this figure and divide it by the number of workers in the area to be conditioned. That tells about how much it will cost to air-condition the plant, per worker.

If the final figure is between \$300 and \$1,000 per worker, experts say it pays to consider air-conditioning the plant. With those approximate costs, a production increase of 1.5 per cent. would just about pay for the initial outlay. A greater production increase means a saving, and, as Carriers Corp. points out, it is almost guaranteed.

These figures show that for an average annual outlay of 55 cents per sq. ft. of building floor space, the increase in profit as a result of greater worker output may range from 26 to 120 per cent. Or, the increase in profit can be realized with an air-conditioning cost of only about 1.35 per cent. of yearly wages.

Another method of finding out how much of an increase in worker efficiency is needed to break even on air-conditioning costs is used by Minneapolis-Honeywell. A 1.3 per cent. boost in worker efficiency, they say, pays for air-conditioning in the average new building. In an already existing building, the necessary increase is only slightly higher, 1.5 per cent. Minneapolis-Honeywell has developed this formula to figure these percentages:—

Owning and operating costs of air-conditioning per sq. ft. per year	Percentage of efficiency increase needed to pay for the cost of a complete air-conditioning system,
Salaries and wages per sq. ft. per year	

To determine salaries and wages per sq. ft. per year, the year's pay-roll is divided by the number of sq. ft. which should be air-conditioned.

How Many Plants are Air-conditioned?

In the South, many more plants and homes are air-conditioned than in the cooler parts of the U.S. in the

North. This year 40 per cent. of new factory buildings and 10 per cent. of old factory buildings in Atlanta, Georgia, will be air-conditioned. In Dallas, Texas, 74 per cent. new and 50 per cent. old factory buildings, and in Houston, Texas, 70 per cent. new and old factory buildings will be air-conditioned. All in all, only 5 per cent. of U.S. factory buildings are air-conditioned. By 1980, however, it has been predicted, almost every factory in Atlanta, Dallas and Houston and in New York will be air-conditioned.

Air-conditioning was early carried out in textile mills. Serious difficulties develop there when atmospheric conditions become unbearable. Complaints of workers multiply. Tension between labour and management mounts, productivity decreases.

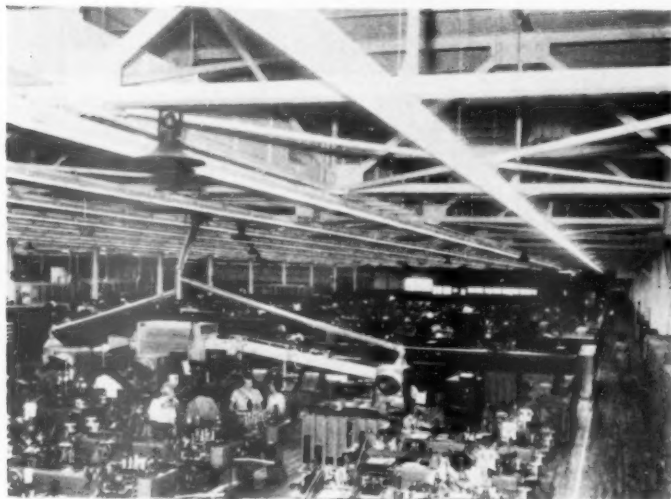
In synthetic fibre, plastics, film and pharmaceutical plants, air-conditioning has proved particularly helpful in

humidity of 5 per cent. is required, while a cotton-weaving mill requires 70 to 80 per cent.

Some companies have the greatest savings in efficiency, turnover and absenteeism only when they install a total air-conditioning system. Other firms may need to air-condition only one or two areas, and others need to only for a few workers. Here are three short case histories from the experience of Carrier Corp.

Complete air-conditioning paid dividends for a plant in the south where controlled temperature and humidity are almost a necessity. After three years of air-conditioning these advantages were seen: better workmanship at lower cost, attraction of more qualified personnel, less absenteeism from colds, increase in building longevity, and elimination of rust caused by excessive humidity.

In a furniture factory were two areas where the temperature rose above 100° F. Two floor air-conditioning units



Ceiling-mounted distribution ducts for air-conditioning.

maintaining the proper product quality. For example, the pharmaceutical firm, Chas. Pfizer and Co., has reported that 30 to 40 per cent. of its plant areas are air-conditioned to-day. Some of them have the additional protection of complete sterility. This means that recirculated air cannot be used.

To-day, air-conditioning of large manufacturing plants, particularly of windowless or blacked-out construction, is becoming more common. The buildings are constructed expressly for air-conditioning and the operating cost apparently is not excessive. For top-quality and optimum production in the textile industry the relative humidity must be kept constant on each textile process though the actual level may vary from room to room. It ranges from 50 per cent. up to 90 per cent. for different fibres and processes. Food production is more dependent upon maintaining a constant level of relative humidity than the actual level used.

Different Conditions in Different Industries

Air-conditioning is desirable in many branches of industry: Manufacture of engines and airplanes; food of any kind; instruments; printing; laboratories; photographic films; textiles; synthetic products; steel; tobacco, etc. In some industrial fields the value of air-conditioning is only beginning to be appreciated.

But different industries require different conditions. Thus, in the manufacture of electric cables a relative

humidity of 5 per cent. is required, while a cotton-weaving mill requires 70 to 80 per cent.

Although a steel mill was air-conditioned, temperatures near the open hearth furnaces soared as high as 170° F. "Spot" air-conditioning units were used for the men in these areas. There are two ways of "spot" cooling. Either the man is blanketed with cool air as he works, or there is a specially climatized station where he can go to refresh himself.—Usually several methods of cooling are combined for optimum results.

To give a clearer indication of its functions, W. G. Gamblin Ltd., Churchfields Road, Salisbury, Wiltshire, has changed its name to the Salisbury Transport and Cold Storage Co. Ltd. The company's management and operation remains the same.

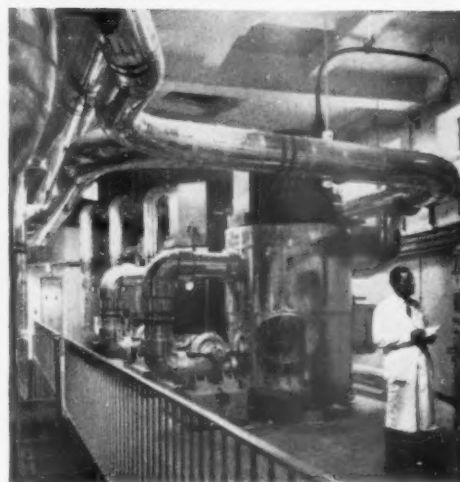
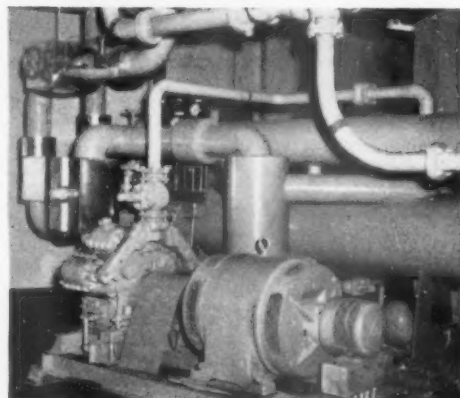
The Electrical Engineers' Exhibition at Earls Court will open on March 21, 1961, for five days. Provisional space bookings have increased this year and over 460 of Britain's leading electrical manufacturers will show their latest developments to the trade. The exhibition will occupy nearly 500,000 sq. ft.

Craig-Nicol Ltd., Glasgow, have received the approval of the Glasgow Planning Committee for conversion of a building, formerly a paint factory, at Portman Street, to the manufacture of refrigeration insulation material.

ENGLISH ELECTRIC HOUSE



English Electric House now stands on the famous "Gaiety" site, Aldwych, London. Certain sections of this palatial building are fully air-conditioned. On the right can be seen the refrigeration side of the air-conditioning system and the air handling equipment below. The refrigeration plant is by York Shipley Ltd. (See also page 916.)



REFRIGERATED SHIP AS "SHOP WINDOW"

South Africa's Department of Commerce and Industries is taking a 4,000-ton "floating shop window" up the East Coast of Africa to the Persian Gulf this month. The *Van Riebeeck* has been transformed into a grand display cabinet for the Union's exports. Its nine refrigerated chambers are packed with fresh South African fruit and vegetables. Space normally given over to more than 200 passengers has been turned into a showroom for other Union-made products.

The next Mechanical Handling Exhibition is to be held at Earls Court, London, England, from May 8 to 18, 1962. It will be the eighth in the series of this biennial exhibition which started in 1948. Over 300 firms displayed their products at the 1960 exhibition, occupying 500,000 sq. ft. of space within the hall and extending into the forecourt to provide a spacious outdoor demonstration area.

The Pyrene Company Limited have pointed out that in a news item entitled "Universal Returns to Britain" in our June issue, reference was made to a "bonderized"

product. The word "Bonderized" is a trade mark of the Pyrene Co. Ltd. and we regret that the distinction was not made.

OBITUARY

Mr. H. F. Bamber (Member)

We much regret to record that Mr. H. F. Bamber, born at Spalding, Lincs, in 1883, died in the spring. Having received early training as an engineer, he served his apprenticeship in the electrical and marine engineering industries and spent much of his early life on design work in the latter branch.

During the 1920s he joined York Shipley Ltd. and was associated with them for many years dealing mainly with heavy refrigeration and air-conditioning.

In 1934 he formed together with Mr. P. C. Clayton, of Wisbech, a company for the application of recent refrigeration developments and constructed many gas stores, quick-freezing plants and high-humidity stores for special applications in this country and abroad.

He had remained actively associated with Clayton and Bamber Ltd. and a subsidiary company during his later years.

The Institute of Refrigeration Bulletin

Institute Headquarters: New Bridge Street House, New Bridge St., London, E.C.A (Central 4694)

REPORT OF THE EXECUTIVE COUNCIL

For the year ended March 25, 1960

THE executive council, in its report for the year ended March 25, 1960, states *inter alia* :—

Membership

"The members of the membership committee and of the panels responsible for advising on the grading of applications for membership have again devoted a great deal of care and attention to the investigation of the claims of candidates for membership, and the council desires to express its appreciation of their work. The membership of the Institute has continued to increase steadily, but still not at the rate which might have been expected. However, the increase was rather larger during the year under review than during the past three or four years. The council hopes that this encouraging trend will be maintained and that members will do what they can to encourage applications for membership from persons qualified in accordance with the by-laws.

"The total membership now stands at 880, made up of 6 honorary members, 248 members, 252 associate members, 17 companions, 230 associates, 117 graduates and 10 students. During the year 13 members of the Institute have died, 9 have resigned and 7 were removed under By-law 7. 70 new members have been elected.

Education

"The council and the education committee have continued to take a keen interest in the activities of the National College for Heating, Ventilating, Refrigeration and Fan Engineering.

"It was announced in last year's report of the council that the details of the design of the new building for the college had been agreed between the governors of the college and the Ministry of Education. Work on the erection of the building is now proceeding and there is every possibility that it will be ready for occupation in time for the beginning of the 1960-61 session.

"The Council is pleased to be able to report that the appeal of the governors of the college to industry for the sum of £50,000, to provide the special services and equipment required for the new building, has been successful. The education committee of the Institute, at the request of the college authorities, has considered and made recommendations in con-

nexion with the provisions of refrigerating plant.

"During the current session 15 students are taking the refrigeration diploma course and one is taking the associateship course in refrigeration at the National College. Nine of those taking the diploma course are from overseas and the remaining six are from this country. Your council is perturbed at the paucity of students from this country compared with the numbers from overseas and trusts that the flow of students from the British refrigeration industry will be increased to take full advantage of the facilities of the new building.

"The governors of the college have accepted certain recommendations put forward by your council for a revision of the structure and syllabus of the refrigeration diploma course. These recommendations had followed a full study, based upon past experience and anticipated trends in the technology, by the Institute's education committee. The college has also accepted the Council's suggestion that, as from the 1960-61 session, the standard of entry to the course shall be a pass at the A1 stage of the higher national certificate in mechanical engineering.

"Of the 12 students who sat the refrigeration diploma examination of the college for the 1958-59 session, seven obtained the diploma, one was referred back and four failed.

"Twelve students are attending the first year of the evening classes in the science and technology of refrigeration at the college during the present session and eight are taking the second year of the course.

"Many of the full-time and part-time students at the college have attended the sessional meetings of the Institute and several of them have applied for membership.

Papers

"The meetings of the Institute during the 1959-60 session have again been held in the Memorial Building of the Institute of Marine Engineers at 76 Mark Lane, London, E.C.3. This has proved to be an excellent venue for the meetings and your council is most grateful for the facilities provided by the Institute of Marine Engineers.

"The sessional meetings held during the year under review have been exceptionally well attended and the papers which have been read have evoked interesting discussions.

"As an addition to the normal programme of evening meetings, an all-day symposium on 'Construction of cold stores for fruit' was held at Ditton Laboratory

on March 16, 1960. Owing to the limited accommodation at Ditton, the number of members who could attend was restricted to 45 and consequently many who wished to participate in the symposium were unable to do so. In view of the success of this meeting, your Council will consider the possibility of organizing further all-day meetings in the future.

"The papers committee again arranged for a leading figure in the field of refrigeration from overseas to present one of the papers; in March, 1960, Dr. E. Baumgartner read a most interesting paper on 'European Refrigerated Transport by Railway.' Our thanks are due to Dr. Baumgartner for travelling from Switzerland to present his paper.

"The council wishes to express its thanks to the authors of the papers and to the members of the papers committee for once again producing so interesting and well balanced a programme of papers.

Research

"Mr. K. I. Murray, who had been at the National College for Heating, Ventilating, Refrigeration and Fan Engineering for the past three years as a research scholar, has now left the College. He had been working on the project, sponsored by the British Refrigeration Association, on the performance of dry expansion evaporators using Refrigerant-12. As a result of his work, Mr. Murray has been awarded the Ph.D. of London University.

"Before he left, Mr. Murray had reached the stage of having two evaporators ready for test and the staff of the college will shortly be testing them.

Tenth International Congress of Refrigeration

"As all members will doubtless be aware, the Tenth International Congress of Refrigeration was held in Copenhagen in August, 1959. The meetings of the congress were held in the Royal Technical University of Denmark and many visits of technical and general interest were arranged for congress members. In addition to the normal meetings of the commissions of the International Institute of Refrigeration, three plenary sessions were held.

"The congress was a great success, more than 1,750 people from 43 countries enrolling as members. The British delegation, numbering over 200, was one of the largest and was led by the President of the Institute, Sir Rupert De la Bere, Bart., K.C.V.O. More than 50 members and relatives took advantage of the arrangements for travel and hotel accommodation organized by the Institute.

"At the general conference of the International Institute of Refrigeration, which was held in Copenhagen at the time of the Congress, members of the Institute were appointed to the following positions:—

1. Dr. J. C. Fidler was re-elected president of the technical board.
2. Mr. K. C. Hales was re-elected president of commission VIII.
3. Mr. G. Lorentzen was elected president of commission III.

During the congress, the first award of the newly instituted Ottesen Medal was made to Dr. J. C. Fidler and the medal was presented to him by the

Prime Minister of Denmark. The medal, which commemorates the work of the late A. J. A. Ottesen of Denmark, will be awarded every four years for outstanding work in the science and technique of refrigeration as determined by the field of work of the International Institute of Refrigeration. Your council feels sure that all members will be delighted that the first award of the medal has been made to a member of the Institute.

"Members may wish to note that the Eleventh Congress will be held in Western Germany in 1963. Details of the venue and date of the congress will be announced later.

Diamond Jubilee Dinner

"The diamond jubilee dinner of the Institute was held at the Savoy Hotel, London, W.C.2, on Wednesday, January 27, 1960. By using an overflow room, which was connected to the main hall by loud-speakers, it was found possible to accommodate 660 members and guests at the dinner. Your council is considering alternative venues providing more accommodation in one room for future dinners.

"The president, Sir Rupert De la Bere, Bart., K.C.V.O., was in the chair and the guest of the evening was The Right Hon. The Viscount Simon, C.M.G., chairman of the Port of London Authority. Viscount Simon proposed the toast of the Institute, to which the President replied. Mr. J. C. Taylor, Member of Council, proposed the toast to 'The Guests' and Commander Douglas Marshall, R.N.V.R., Member of Parliament for the Bodmin Division of Cornwall, made the response. Among the official guests of the Institute were Lt.-Colonel Lord Dudley Gordon, D.S.O., LL.D., Sir Allen Brown, C.B.E., Vice-Admiral Sir Norman Dalton, K.C.B., O.B.E., Sir Harry Melville, K.C.B., F.R.S., Sir William Wallace, C.B.E., LL.D., Dr. B. K. Blount, C.B., Dr. J. E. Garside, Mr. J. A. Howie, Professor D. M. Newitt, M.C., F.R.S., Mr. H. A. Secretan, C.B.E., J.P., Air Vice-Marshal G. Silyn Roberts, C.B., C.B.E., A.F.C., Major-General H. H. C. Sugden, C.B., C.B.E., D.S.O., Dr. G. B. B. M. Sutherland, LL.D., F.R.S., and Mr. T. Whittaker.

Presidency

"At the conclusion of his second year of office as President, the Council wishes to place on record its sincere appreciation of the great interest Sir Rupert De la Bere, Bart., K.C.V.O., has shown in the activities of the Institute.

"It is with much pleasure that the members of council announce that Engineer-Commander W. R. Sinclair, R.A.N. (retd.), B.ENG., has accepted their invitation to be president of the Institute for the year commencing March 26, 1960. Commander Sinclair has been a member of the Institute since 1931 and it is 25 years since he was first elected a member of council.

Chairman of Council

"In view of the inability of the president to attend all the meetings of the executive council, it was again deemed advisable to appoint a chairman of council to conduct the business at council meetings. Your

(Continued on page 958)

SHOP REFRIGERATION NEWS



THE GROUSE SEASON

By Our Special Correspondent

WRITING this on the twelfth of August, the day the grouse season starts, I am in a mood to be topical. I have three of them to work off, and all three are mainly connected with the development of self service, and of supermarkets in particular.

Grouse No. 1

Self-service retailers are getting off the rails or—not to overstate the case—are allowing themselves to be diverted from the main lines of the most smooth-running system of merchandising that has ever been invented on to meandering branch lines of rather muddled methods. Self service, essentially an orderly, immaculately tidy medium of food retailing, is in danger either of degenerating into cheap-jackery or of reverting to the confusing miscellany of the old-style general store of the country village.

This is the negation of progress, a serious check to the advance of refrigeration at retail level, because it robs the temperature-controlled presentation of perishable foods of its hygienic and appetizingly attractive appearance. It means that the initial cost of installing, and the continuing (albeit not heavy) cost of running, a cabinet is made so much less worthwhile.

Always when slackness and bad habits develop in the marketing of food, or when retailers slip back into the bad old ways, the attitude of the reactionaries is that their customers prefer it that way, and the customer, they will tell you, is always right.

That is sheer heresy and arrant nonsense. Customers or, if you prefer the expression, the shopping

public, must be trained to like what the progressive retailer thinks they ought to like. The public did not ask for their food to be sold under refrigerated conditions, nor for self service, nor for quick-frozen products, but they now accept all three as a matter of course. Come to think of it, nothing new that is ever introduced in retailing is in response to a demand from the public.

I have received photographs recently of long runs of the latest types of cabinets or of individual cabinets that are also the most up-to-date models you could wish to see. But I can't publish them (except as examples of how not to do and that might be regarded as offensive, if not libellous), because they are surrounded by, surmounted by, almost submerged by mess and muddle. In one instance the cabinet, with stock stacked in irregular heights all well above the load line, has what are known as shopper-stoppers attached to the front, and the combined effect resembles a street vendor's stall.

Shopper-stoppers, normally attached to wall-shelving, are wire trays or bins devised to catch customers in the midriff as they lean forward to help themselves to an item of merchandise. This dig in the diaphragm, it is contended (and with some truth, I reluctantly have to admit) directs the attention of the customer to the contents of the inconveniently projected bin or basket, causing her to exclaim "I'll take one (or some) of those" and promptly to pop it (or them) in her basket.

But it is only fair to add these untidy trends are not confined to self-service shops. The greengrocer

who puts half his stock on the pavement outside the shop, the fishmonger who uses his quick-frozen food cabinet as a freezing medium for poultry, the food retailer of any kind who clutters up with trays of merchandise the rails provided on the front of refrigerated cabinets for customers' handbags and baskets; these are all retarding the progress towards more hygienic, more convenient, and more attractive presentation of food.

Grouse No. 2

On several occasions in these reviews on retail refrigeration, I have shown examples of how other



Above and below: Two contrasting examples of the way adjacent equipment can be designed to blend with the refrigerated cabinet.



Meat refrigeration from two angles in Cardiff's first supermarket; as seen by the customer, and below . . .

items of equipment in the shop can be blended with the design and finish of the cabinet. Last month, I illustrated an example in a shop at Bedford. I make no apology for showing this same fitting this month from another angle because it makes such an interesting comparison with another example found in Cardiff a few days ago.

In the first example, an installation by The Bedford Refrigeration Co. Ltd., the housing of the refrigerating machinery for an adjoining Prestcold cabinet provides a stand for the slicer and scales. In the second, a small and most attractive self-service shop trading under the name of the Ideal Stores at The Plulog, Cardiff, has a case of ribbed hardboard topped with laminated plastic to provide a surface for the scales and a certain amount of display, alongside a Hussman cabinet for provisions and dairy goods. This cabinet and also a Hussman q.f.f. cabinet was installed by W. J. Creemer Ltd. of Cardiff.

The cold room, meat-preparing room, and staff's eye view of the store at Cardiff's first supermarket.





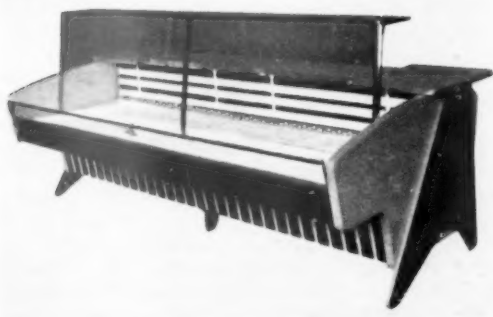
The Cascade cabinet for dairy goods in Andrew's supermarket. The column display of frozen foods partially conceals the immediately adjacent q.f.f. cabinet.

Both these examples are in small shops. But why is it that, in this country, we so seldom trouble to reverse the procedure by co-ordinating the design of refrigerated display and serving equipment with that of the fittings in the rest of the shop? The supermarket companies who can afford to do this sort of thing really well, simply don't bother. They are invariably content to put in cabinets of standard shape and finish, regardless of the nature of the interior décor or of the colour and conformation of the rest of the equipment.

That is one of the lessons that can be learnt by visits to some of the Continental stores. (Why is it always assumed that we can learn more about the refrigeration and retailing of foods by going to America when there is so much worthy of study in the European countries?)

But it is possible to see the application of this principle of integrated design in London—the food store in Charlotte Street, described and illustrated in the January number of *MODERN REFRIGERATION*. The refrigeration and shopfitting of this store were the work of one firm, Wahl, which also does, of course, produce standard models. They are repre-

One of the Wahl models now available from J. P. Page & Co., Ltd.



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sented in the United Kingdom by J. P. Page & Co., Ltd. One example of Wahl products, a cabinet combining good scope for display with improved serving facilities, is shown here. The shelf at the back for serving and wrapping will be noted. I do not know of any standard cabinet in this country which incorporates a serving device of this kind into its design, although it is not uncommon in America.



Period contrasts: the 1948 and 1960 Hussmann installations for Ashton's of Cardiff.



Grouse No. 3

My third and last grouse is that, apart from two cabinets combining low-temperature display for frozen food with normal refrigeration dairy goods and the like, both of which I have described in recent articles, little seems to be done towards bringing refrigerated display to a more convenient height, for self-service shoppers.

But away with grouses. Let us look at some more achievements—another self-service outlet visited in Cardiff—the 3,000 sq. ft. supermarket of Andrews and Sons at the Hayes, a complete contrast dimensionally to the ideal store shown in the second and third illustrations. The first supermarket in Cardiff, it replaces a tiny grocer's shop which had been run by the Andrews family on a small part of the land now covered by the supermarket, for over 100 years.

As with many supermarkets, one of its major

SHOP REFRIGERATION NEWS

attractions is the long line of refrigerated display running the full width of the shop at the back, and given up to fresh meat, cooked meats, delicatessen, and bacon. This rear section is virtually a shop in itself; self-contained except for the fact that payment must be made at the check-out. Half the total length of the 30-ft. run of Hussmann cabinets at the back is given up to meat, and the bay behind that section is fitted out as a butcher's shop with a conveniently-sited cold-room (held at 28-32°F.) immediately adjoining. All the refrigeration was carried out by Hussmann and includes a Cascade model for dairy produce.

CHINGFORD STORE INSTALS TALISMAN

FULLY equipped throughout the first eleven self-service shops with Frigidaire refrigerated storage and display cabinets, the rapidly expanding firm of James Grundy & Sons Ltd., have now opened their twelfth store at Chingford, Essex, and in so doing have become one of the first users of the new Frigidaire "Talisman" display cases. The installation at



Frigidaire display cases from the new "Talisman" range installed at "G. & S." Food Fair, Chingford, Essex. Nine feet of the case is for cool storage of provisions and the remaining 6 ft. operates at zero degrees for frozen foods.

the "G. & S." Food Fair, Old Church Road, Chingford, was by Brett Daniels Ltd., Frigidaire distributors for the area.

Brett Daniels Ltd. have fitted a 15 ft. run of cases into one wall of the new shop. The first 9 ft. of the run is for cooked meats and provisions, while the

While I was in Cardiff, I visited a fish shop in the market, owned by a family concern that can, I think, be regarded as one of the pioneers of refrigerated display in the fish trade. Every item of merchandise here, except for a few incidentally-shown canned and bottled goods, is on refrigerated display.

These premises of E. Ashton (Fishmongers) Ltd. are a remarkable testimony to the progress made in refrigerated display in the last twelve years. Compare the cabinets in the two illustrations on the previous page, showing, respectively, those put in by Hussmann in 1948 and those just installed by the same people. There are also two cabinets for frozen foods, one of which was installed by Prestcold some time ago.

remaining 6 ft. is for frozen foods, an insulated partition dividing the two sections.

The provision section operates at 38/42°F. and the frozen food section at 0°F.

FIBREGLASS REINFORCED PLASTICS

To keep industry up-to-date with recent developments in the glass fibre field, Fibreglass Ltd., St. Helens, Lancs, have produced three booklets with the collective title "Fibreglass Reinforced Plastics." These deal with the three separate aspects of properties and suppliers, introduction and materials, and moulding techniques, design and fabrication.

A gigantic Hungarian pick-and-choose restaurant has opened in the Moscow Gorky Park as part of the Hungarian exhibition now open there. Built of glass, it has 28 entrances and exits on the ground floor and can serve many hundreds of people simultaneously. In the cold food section dishes are displayed on 152-ft. long refrigerated counters.

ROTARY HIGH VACUUM PUMPS

ALTHOUGH rotary high vacuum pumps are designed to handle a wide range of liquids such as for cooling water duties, dangerous liquids, chemicals, etc., a disadvantage has been that the heavy wear to which these pumps are subjected has sometimes meant a deterioration of performance resulting from contamination of the pump by the condensed process vapours, the most common of these being water vapour.

To obviate this difficulty the Pulsometer Engineering Company Ltd., now fit air injection scavenging to their high vacuum pumps which are so arranged that the scavenging air enters the cylinder after the rotor blade has isolated the suction port. The air is then able to support a considerable amount of the water vapour without condensation occurring, particularly when the mixture is raised in temperature as a result of the pump's discharge action.

COMMERCIAL AND INDUSTRIAL SECTION

Manufacturers' and Distributors' News

A. C. Murdoch, B.Sc. (ENG.), A.C.G.I., D.I.C., has been appointed chief technical officer of Teddington Refrigeration Controls Ltd. The appointment is to take effect from August 8, 1960. Prior to this appointment, Mr. Murdoch was



Mr. A. C. Murdoch.

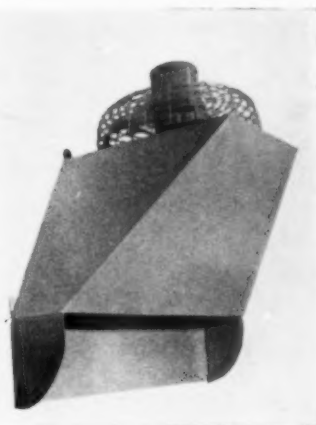
chief research and development engineer to the Prestcold Division of The Pressed Steel Co. Ltd. In his new post, Mr. Murdoch will have jurisdiction over all the engineering fields of Teddington Refrigeration Controls Ltd., including development and project engineering of the ranges of products for refrigeration and heating control. Mr. Murdoch is well known throughout the refrigeration world, and has represented the B.R.A. on several committees of the British Standards Institution and the International Institute of Refrigeration. He is also an examiner in Refrigeration Practice for the City and Guilds Institute, London.

Jablo Plastics Industries Ltd. have formed, with the Maltese section of C. H. Bailey, a company in Malta, with a capital of £50,000, under the name of Jablo Plastics Industries (Malta) Ltd. This company will manufacture under licence the various Jablo products, mainly of the expanded plastic type now widely used for insulation in the refrigeration industry. The favourable geographical position of Malta will enable Jablo to supply their old and new customers in the near and far East, as well as Mediterranean and African users, at favourable freight charges, which play an important part in the transportation of such bulky, lightweight materials. The board of the new company comprises Lord Selsdon, D.S.C., chairman of the Jablo companies, Mr. B. Jablonsky, Jablo Propellers (of Spitfire, Hurricane and Beaufighter fame) Mr. Christopher H. Bailey and Mr. Cecil F. Pace, a well-known industrialist in Malta.

Dr. J. F. Downie Smith has been appointed president of the Carrier Research and Development Co., one of the newly-formed constituent operating groups of the Carrier Corporation of the United States. A Glaswegian, Dr. Downie Smith started his working life as apprentice engineer with the old Albion Motor Car Company at 13 years of age and later graduated with special distinction from the Royal Technical College at Glasgow and Glasgow University. For a number of years he has been head of the Research and Development Division of the Carrier Corporation of Syracuse, New York. Mr. Ralph S. Reynolds, managing director of Carlyle Air Conditioning & Refrigeration Co. Ltd., an associate company in the United Kingdom, said recently that the Carrier Corporation had announced a new operating division to be known as "Carrier Air Conditioning Company." The object of doing this was to bring about improved co-ordination of the various operations.

Latest addition to the range of Miniveil air curtains manufactured

by **Minikay Ltd.,** London, E.C.2, for use on open coldroom doorways, is a new unit designed specifically for use on refrigerated transport. The main ductwork of the unit is very shallow in depth and has been designed to fit into the overhead space inside the outer door, but outside the actual insulated door. The unit is served by a centrifugal type fan driven by a 1/10 h.p. motor run off a 12-volt battery. The fan can be mounted in some remote position and connected to the main unit by flexible ducting. The whole



assembly weighs 40 lb. Arrangements are made for automatic operation thus eliminating the danger of inadvertent running down of the vehicle battery.

G. & J. Weir Ltd., Cathcart, Glasgow, S.4, have arranged to acquire the complete compressor business of Alley & MacLellan (Polmadie) Ltd. G. & J. Weir have, for many years, manufactured a wide range of compressors of their own design for marine and specialised industrial applications. Within the next six months the production of "Alley" units will be transferred from Polmadie to the Cathcart Works of G. & J. Weir. The transfer is being planned to ensure that quoted delivery dates will be honoured, and that there will be full con-

COMMERCIAL AND INDUSTRIAL

tinuity of service to customers. In addition to continuing the manufacture of compressors to "Alley" designs, G. & J. Weir undertake to maintain and operate without interruption, spares and service facilities to customers of Alley & MacLellan (Polmadie) Ltd., and its subsidiary company, Browett Lindley (1952) Ltd. To ensure business continuity, the majority of the sales, technical and design staff of Alley & MacLellan (Polmadie) Ltd. will be absorbed into the Weir organisation. In addition, the existing "Alley" sales and service organisation for the United Kingdom will be maintained, operating through the Head and Branch Offices of G. & J. Weir Ltd.

The Drayton Regulator and Instrument Co. Ltd. have acquired an additional 55,000 sq. ft. of factory space in West Drayton. Following the removal of S. C. Johnson & Son Ltd. (Johnson's Wax) to their new establishment at Frimley Green, Surrey, The Drayton Regulator and Instrument Co. Ltd. will take over their Bridge Works towards the end of the year.

Mr. J. A. Harvey has resigned as general sales manager (Bisol) of the chemical division of The Distillers Co. Ltd. and Mr. R. M. F. Fenning (formerly marketing manager) has been appointed in his place. Mr. A. A. Puddick, export sales manager, has been appointed marketing manager, and Mr. J. Tedd succeeds Mr. Puddick as export sales manager.

A new constant-flow valve, manufactured by Black Automatic Controls Ltd., Corsham, Wilts, a member of the Elliott-Automation group, automatically maintains a constant rate of fluid flow irrespective of variations in the supply or delivery pressures. Where problems of corrosion arise the simplicity of the design enables all parts in contact with the liquid to be constructed of stainless steel or other corrosion resistant materials. The valve is self-actuated and consists of a cylindrical chamber with a freely-moving, spring-loaded piston to which is fitted a form of sleeve valve. Liquid enters at the inlet port and flows inside the valve sleeve through a series of ports of which the area is varied as the piston slides up or down. It then passes through the by-pass pipe, which carries a fixed orifice, and thence to the outlet port. A constant pressure drop is maintained across the orifice by the action of the spring-loaded piston

which slides up or down in the cylinder as the supply pressure decreases or increases and opens or closes the ports of the sleeve valve.

Mr. A. B. Sinton has relinquished his position as assistant supply manager with Frigidaire Division of General Motors Ltd. and is taking up a position with Ranco Ltd. as a group supply manager.

S. H. Oliver has been appointed manager of the purchasing department of Castrol Ltd. in succession to the late A. J. Stafford. Mr. Oliver, who is 49, joined W. B. Dick & Co. Ltd. in 1932 and entered his present department when that company joined the Castrol group some years later. He became assistant purchasing manager early last year.

K.D.G. Instruments Ltd., Manor Royal, Crawley, Sussex, announce the appointment of Mr. L. A. Armstrong as chief designer responsible for pressure elements for their range of tank contents gauges, pressure and differential gauges, pressure switches and thermometers.

As a result of the expansion of their sales force, Morphy-Richards announce the following promotions and appointments of area managers: Scottish area—D. S. Reid, Morphy-Richards Service Depot, 116, West Campbell Street, Glasgow, C.2; Northern area—L. W. Swinnerton, Caldercott, 20, Weygates Drive, Hale Barns, Altrincham, Cheshire; Midland area—R. E. Milledge, Ronlyn, Church Road, Snitterfield, Nr. Stratford-upon-Avon; Southern area—W. Read, 39, Ashfield Road, Andover, Hants. South-Western area—G. E. Johnson, 92, Ellacombe Road, Willsbridge, Gloucestershire.

Minikay Ltd., Friars House, 39/41, New Broad Street, London, E.C.2, have developed a unit for installation over doors which prevents the entry of flying insects. Too often, states the company, food processors are baffled by the problem presented by the need to maintain the highest standards of hygiene and yet to have "ever open" doors for the movement of produce. Flying insects have no respect for elaborate arrangements designed to ensure utmost cleanliness. If an open doorway offers itself, the pests will not only foul any exposed foodstuffs, but, given the slightest opportunity, will quickly breed and so build up a menace of even greater proportions. The "Flystop" provides a controlled curtain of air.

A new "light quality" tack-rag has been introduced by Anti-Dust Services Ltd., 53a, Stafford Street, Dudley, Worcs, using a new tack-rag impregnation, for finishing lines with a separate tack-ragging section using unskilled labour. In such cases a high turnover of labour is common with the attendant risks of careless use and possible smearing with the more highly impregnated tack-rags. The new tack-rag has an impregnation weight of 45 to 47½ per cent. of the total weight of the rag. For comparison, the impregnation weights of the standard quality and the extra quality are 52½ to 55 per cent. and 60 to 62½ per cent. respectively. All three qualities are available in rolls, cut bulk in three sizes and individually packed in 18- by 34-in. size only.

Mr. Frederick Baillie has been appointed production manager of the Cambridge Instrument Co. Ltd. In this position he is responsible for all aspects of production planning at the company's three factories in the United Kingdom. Mr. Baillie was formerly general works manager at the Greenock factory of IBM (United Kingdom) Ltd. Prior to joining IBM in 1955, he spent a year with Muirhead & Co. Ltd. and, before that, several years with Kelvin & Hughes Ltd.

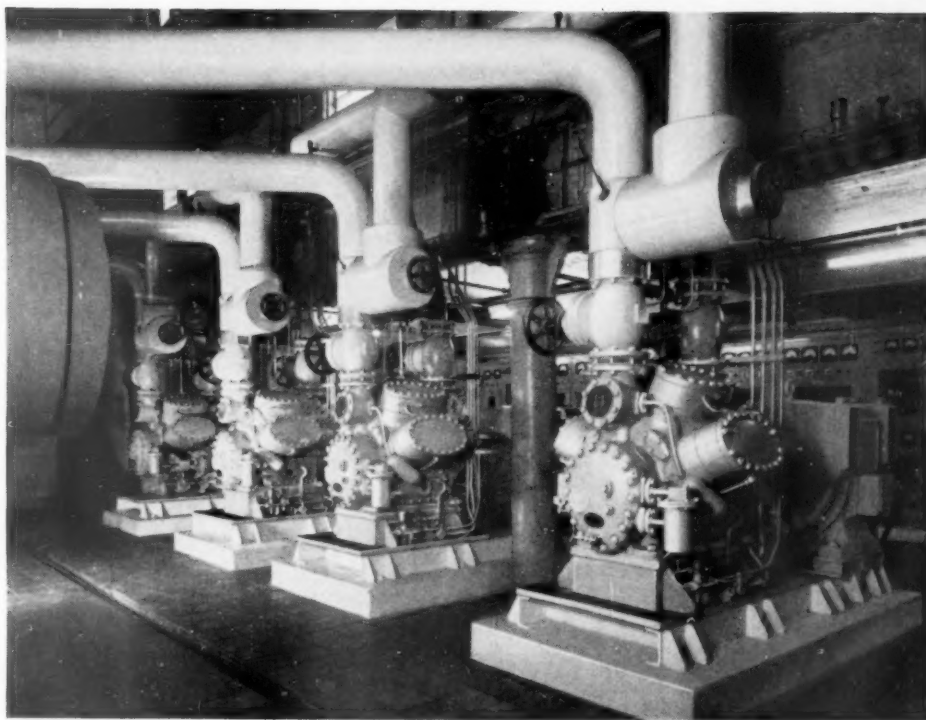
The Midland regional office in Birmingham of Associated Electrical Industries (Rugby) Ltd., has moved from its addresses in John Bright Street and Hospital Street to the following single address: Gloucester House, 65, Smallbrook, Ringway, Birmingham, 5 (Telephone: Midland 6335 and Midland 9551). The special sales offices of AEI-Birlec Ltd., A.E.I. Lamp and Lighting Co. Ltd., A.E.I. Sound Equipment Ltd., the cable division, radio and electronic components division, and telecommunications division, as well as Siemens Ediswan lamps and lighting, the X-ray service department and the construction and erection departments remain at their present addresses.

Automatic Cooling Engineers Ltd., refrigeration engineers, is a new company registered in Scotland with a capital of £1,000 in £1 shares. Directors are A. Sandham of 4, Allan Street, Motherwell and H. G. Sandham of 35, Kerrycroy Avenue, Glasgow.

In order to meet a growing demand for a small relay capable of switching fairly large loads, B. & R. Relays

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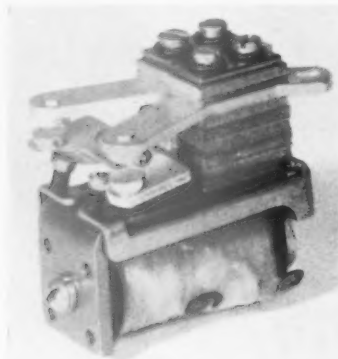
In brewing, for example, it plays a controlling part in all the processes. The illustration shows the four, 8-cylinder, 5" x 4" veebloc compressors, using ammonia as a refrigerant, supplied to Mann, Crossman & Paulin Ltd., Albion Brewery, London, E.C.1.

J. & E. Hall have supplied refrigerating equipment to all the leading manufacturers in the Brewing Industry.

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COMMERCIAL AND INDUSTRIAL

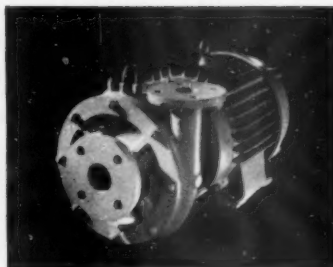
Ltd., Temple Fields, Harlow, Essex, have produced an adaptation of their standard B.11 relay. This new switch, the B.11/2, is fitted with one normally open heavy duty contact, and it has a maximum rating of 10 amps at 240 v a.c., and 20 amps at 30 v d.c. non-inductive. When necessary, the coils can be vacuum impregnated to meet general M.O.D. specification Def. 5000. The B.11/2 relay weighs



only 2½ oz., and has a wide range of applications in various types of industry, as well as in certain types of domestic equipment such as washing machines, refrigerators and central heating appliances. It also has many applications in the vending machine and amusement trade industries.

T. & T. Works Ltd., Leicester, have entered into an agreement whereby they are appointed sole concessionaires for the manufacture and distribution in the United Kingdom and most Commonwealth territories of the American chainveyor overhead monorail conveyor system. The design has several valuable features including light weight with strength, adaptability, versatility, lower cost, total enclosure and ease of installation.

A new range of single-phase centrifugal pumps in sizes from 1 to 5 in. are now being marketed under the trade name "Alcon Thames" by Arthur Lyon & Co. (Engineers) Ltd., 6, Carlos Place, Grosvenor Square, London, W.1. These pumps are suitable for a wide range of applications outside the refrigeration industry including agriculture, civil



engineering, building and public works contracting.

T. Wall & Sons (Ice Cream) Ltd. announce the retirement of Mr. C. A. Kent following 35 years' service with the company. His most recent position was that of development adviser to the commercial director. Mr. Kent joined Wall's in 1925 and held a number of executive positions on the sales and distribution side of the business. At his farewell party on August 5, members of the staff from the company's head office and Scottish, Northern, Western and Southern regions presented him with a cheque contributed by his colleagues throughout the country. The company's board honoured him with a separate farewell dinner.

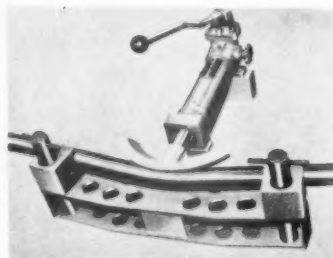
A new, highly-polished polystyrene sheet with improved physical proper-



ties is now being produced by Erinoid Ltd., West Halkin House, West Halkin Street, London, S.W.1

Until now polystyrene sheet for vacuum forming has been available in two surface finishes; either matt or polished. It has not been possible to produce highly-polished sheet direct from the extruder and the polished surface has been achieved by laminating a 0.002-in. layer of polystyrene film to the sheet. Consequently, those requiring highly-polished sheet have had to pay a premium price for the laminated material. Erinoid have developed a method of producing highly-polished polystyrene sheet without lamination. The method is known as roller polishing. The accompanying photograph shows a comparison between vacuum formings produced from matt and roller polished polystyrene sheet.

An extremely efficient hand-operated copper tube bender has now been added to the hand bender section of the "Staffa" range of pipe and tube bending machines by the manufacturers, Chamberlain Industries Ltd., of Staffa Works, Argall Avenue, Leyton, London, E.10. This useful vice or bench-mounted tool will produce right- or left-hand "offset" bends with the minimum of straight in copper tubes to B.S.S. 659/1955, from ½ in. to 1½ in. diameter. It has all the features of portable compression benders, and is equipped with former dies, accurately machined to close limits, and



special machined back guides, to prevent tube deformation. The formers are immediately interchangeable without the use of spanners or special tools, and a patent back clamp ensures perfect automatic grip on the tube without surface marking. The pressure roller can be infinitely adjusted and bends up to 180° can be produced in one operation without heating or filling, and without removing the tube.

The Pyramid Instrument Corporation, of Lynbrook, New York, manu-

FASTER Freezing!

with the *Jackstone* **HOSELESS MODEL**
on land or at sea

Advantages

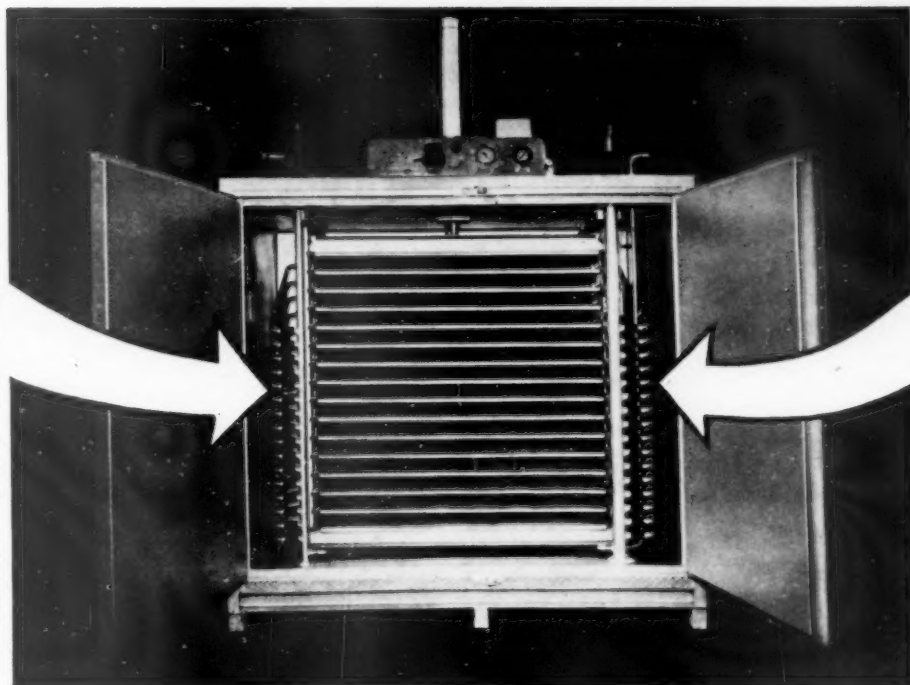
Reduce risk
of breakdowns
and avoid
hold-ups in
production

Reduce
expensive losses
of refrigerant

Reduce costs
of maintenance

Facilitate
faster
de-frosting

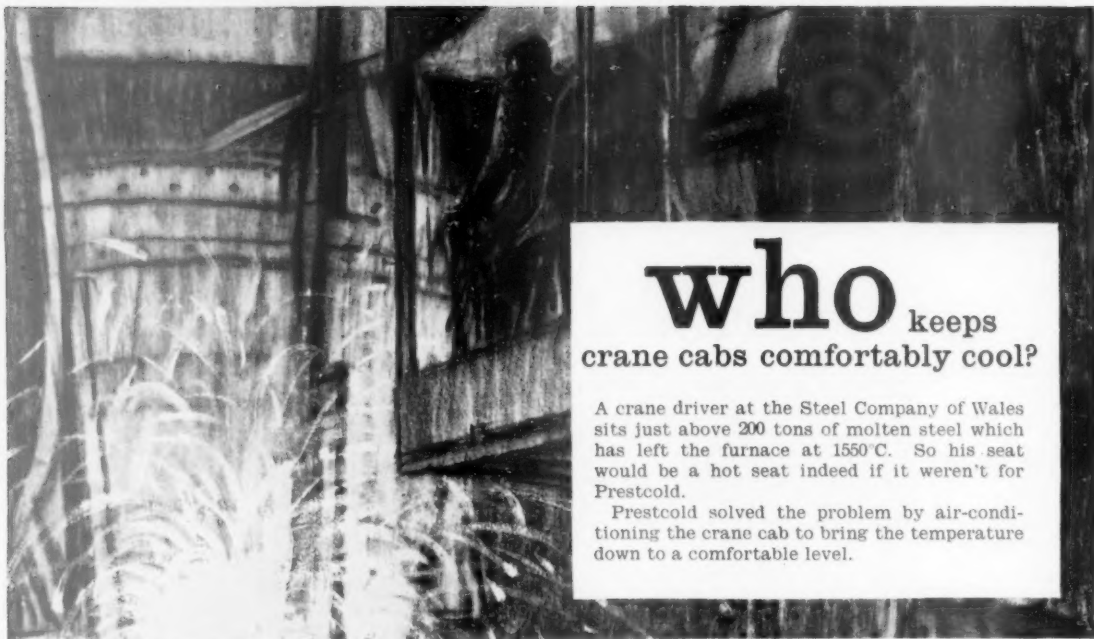
Suitable for
all refrigerants
—freon,
ammonia and
brine



The special patented connections between the freezing plates and the liquid and suction lines incorporate steel trunnions which allow both rotary and telescopic movement during the opening and closing of the freezing plates. The assembly is constructed of finest quality steel with seamless tubing connecting the moving parts. The piston of the telescopic coupling, which is exposed during operation to icing conditions is of mild steel. The complete assembly is finished zinc sprayed. The cabinet is fitted with double doors at front and back for through loading and unloading of freezing trays.

Jackstone Froster Ltd.

HUMBER BRIDGE ROAD • GRIMSBY • ENGLAND



who keeps crane cabs comfortably cool?

A crane driver at the Steel Company of Wales sits just above 200 tons of molten steel which has left the furnace at 1550°C. So his seat would be a hot seat indeed if it weren't for Prestcold.

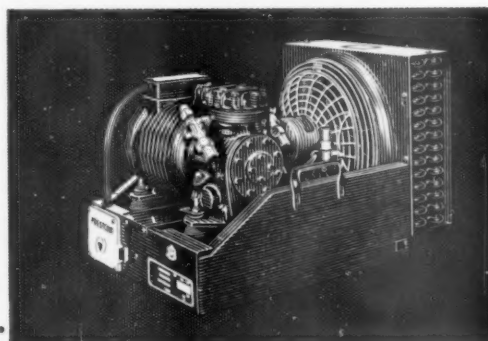
Prestcold solved the problem by air-conditioning the crane cab to bring the temperature down to a comfortable level.

How Prestcold research keeps milk fresh in bulk

When milk is collected in bulk from farms by means of road tankers, there is a considerable saving in labour and transport costs. Reliable and efficient refrigeration equipment is used to cool the milk rapidly and store it at 40°F till it's collected by the road tanker. Prestcold equipment is at the English Milk Marketing Board's initial scheme at Newbury, and was used exclusively for the first extensive Bulk Milk Collection scheme in the United Kingdom.

The Super Presmetic direct-drive motor compressor is an outstandingly reliable way of refrigerating, because its design simply does away with the parts that could cause serious trouble. It's hermetic, yet it can be serviced where it stands. It's economical, giving you more refrigeration per unit than ever before. It's guaranteed for five years. It's made by Prestcold—makers of the largest range of commercial

refrigeration equipment in the country. For full details, post the coupon now. (There's a Prestcold Branch or Agent in your area.)



FOR FRESH IDEAS...IT'S
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To: Commercial Sales Department, Prestcold, Cowley, Oxford

NAME _____

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MR2

facturers of snap-on volt ammeters, have announced that their instruments will be available for purchase in England starting in October. Arrangements have been completed for sales representation, warehousing and service. Martin Schwartz, Pyramid's general sales manager, will arrive in England early in September to launch the company's advertising and distributor programme. The line will include the Amprobe RS-3, a multi-range snap-on volt amp. ohmmeter and the economy multi-range Amprobe RS-1.

Helimatic Ltd., 22-24, Buckingham Palace Road, London, S.W.1, the English associate of the Swedish Elektro Helios group, have appointed



Mr. P. S. Hall as sales manager of their refrigeration division. Mr. Hall, who came into the refrigeration industry as a speciality salesman 15 years ago after serving with Bomber Command during the war, was latterly with Kelvinator Ltd. He is an associate member of the Sales Managers' Association.

Chamberlain Industries Ltd., of Staffa Works, Argall Avenue, Leyton, London, E.10, announce that they have added new machines to their existing range of "Staffa" open frame benders to cover all applications for bending N.B. pipe from $\frac{1}{2}$ to 3 in., and conduit pipe from $\frac{1}{2}$ to 3 in. These machines, which are hydraulically operated, incorporate a patent two-stage action to permit rapid bending speed, whilst the open frame feature permits unrestricted bending in long lengths of pipe in all planes and with the full use of bending templates. Various forming dies are available with each

machine, and these are immediately interchangeable without the use of spanners. The machine itself is completely self-contained, and re-



quires no fixing. The manufacturers claim that "Staffa" open-type benders bend 30 times faster than by ordinary forging methods, and that a piece of 2-in. N.B. pipe can be bent to an angle of 90° within two minutes with unskilled labour and little effort. Various attachments and dies can also be supplied by the manufacturers to increase the scope of the machines for bending flat bars, light-gauge tubes, copper and non-ferrous tubes, and solid bars. Two machines are manufactured and offered with various sets of dies with capacities for $\frac{1}{2}$ - to 3-in. N.B. pipe, $\frac{1}{2}$ - to 3-in. conduit pipe, $\frac{1}{2}$ - to 2-in. N.B. pipe, and $\frac{1}{2}$ - to 2-in. conduit pipe. The company has also launched a hand-operated section bender with a capacity for work normally carried out by geared or power-operated machines. Known as the "Staffa 101," the unit is considered to be particularly suited to transport depot and garage work and for use by blacksmiths, structural, general and maintenance engineers. With the many forming blocks and dies available, angles up to 2 $\frac{1}{2}$ by 2 $\frac{1}{2}$ by $\frac{3}{16}$ in., flat bars up to 4 by $\frac{1}{2}$ in., gas pipe up to 2 in. n.b., bar up to 1 $\frac{1}{4}$ -in. diameter, can be bent cold. It can also produce eyebolts, coils, sharp bends and various types of architectural metal work with the minimum skill and practice, whilst special tools can be provided for bending extruded sections, etc.

A visitor to this country recently, whom we had the pleasure of

COMMERCIAL AND INDUSTRIAL

meeting, was Mr. John-Gabriel C. Montgomery, sales manager of STAL Refrigeration AB of Sweden, one of the companies in the de Laval Ljungstrom group. This group owes its origin to the great Swedish inventors Gustaf de Laval and the brothers Birger and Fredrik Ljungstrom and to their pioneer work in the field of steam turbines. Steam and gas turbines for stationary and marine applications are of course produced within the group. The tradition in refrigeration dates back to 1892 when the first plant was put into operation in a Stockholm brewery. There are two factors that have brought STAL to its position as one of the leading firms in Europe in its field. One is the rapid development in the production and consumption of deep frozen foods in Sweden. The per capita consumption of frozen food is larger than in any other country outside the United States. This development has been possible only by large investment in modern refrigeration equipment—mostly supplied by STAL. The trend of the growth of STAL is parallel to that of frozen food consumption in Sweden. The second factor is the pioneer work done by the company in marine refrigeration where STAL since the war has been a leader in the development and supply of "Freon" equipment. The interests of the de Laval Ljungstrom group are taken care of by de Laval Ljungstrom (Great Britain) Ltd. in London. Among STAL deliveries to the U.K. can be mentioned refrigerating equipment to the big Northern Cold Storage plant in Grimsby and the refrigeration plant in Blue Star's Newcastle Star. It is learned that STAL have appointed Reunert & Lenz Ltd., as their agents in South Africa. This company, founded in 1888, has now 15 branch offices in the Union of South Africa and the Rhodesias.

F.B.I. Conference. — An F.B.I. three-day conference on recruitment and training policy in small firms will be opened by Sir Norman Kipping at Buxton on September 26, 1960. The first national get-together of its kind to be held by British industry, the conference is intended for top executives of firms employing less than 1,000 people. Its purpose is to examine the recruitment and training problems faced by firms of this size and to find possible solutions. The idea has been inspired by

R. S. A. News

By M. R. Hadrys

As can be expected, compiling the list of subjects and ensuring the now expected high standard is maintained is one of the committee's most important tasks that has to be completed well before the following session commences. Although there are many subjects for choice, care has to be taken to avoid a repeat or a connection with any previous subject. Compiling is only the start; speakers have to be contacted and arrangements made to fit in dates when they are free from other commitments. The support given by them and their companies has been very gratifying; many of the speakers have travelled long distances, as did Mr. Bevington, Avonmouth and Mr. Murray, Dartford, to mention only two.

By recalling some past lectures such as

- Deep freezing of poultry
- Halogenated refrigerants
- Cooling plates
- Industrial plant maintenance
- Training methods for servicemen
- Balancing commercial systems
- Refrigeration controls
- Air-conditioning in civil aircraft

members will agree that the committee has avoided repetition and provided lectures of interest to them. The popular "Quiz programme," started last session, has to have a panel selected. It will be recalled that this meeting was held just after Christmas when a poor attendance could have been excused. Nevertheless, the attendance was so good that another meeting of this type can be anticipated in the coming session.

Education has not been forgotten. Members are already registering for the course and it is anticipated that numbers will increase as it is more widely known. Another responsibility of the committee is arranging

examiners for the papers as they are forwarded by the pupils.

It does not appear to be generally known that membership of the Association is not restricted to servicemen alone. Many members are not engaged in service, but in other fields of the industry.

All grades in the industry are eligible for membership and they should write to the hon. sec. Mr. L. Steggel, Committee Rooms, 1, Crane Court, Fleet Street, London, E.C.4, for their application form.

In our last lecture on the freezing of poultry, Mr. F. W. Murray said that using fast growing birds, killed at about 10 weeks, they are semi-scalded, before plucking, in a bath at 126° to 130° F. This ensures the feathers are easily plucked without damage to the skin. Plucking with rubber fingers is automatic on the machine for this purpose. To chill the carcass rapidly throughout, it is placed in a vacuum sealed polythene bag and then immersed in a bath of ice slush. Intimate contact is maintained between the slush and carcass giving rapid heat transfer. Flake ice makers with holding bins capable of holding sufficient ice for 16 hours' usage were shown on slides. This type of ice is preferred as it gives maximum cooling surface compared to blocks of ice in a bath. At a proportion of 1½-lb of flake ice per 3 lb bird, at 33° F., the carcass temperature can be reduced from 100° to 40° F. in approximately 2½ hours. After removal from the bath the birds are frozen, the polythene preventing dehydration with a consequent loss of weight.

The importance of fast freezing in order to present a bird of tender flesh and good colour was stressed. The rate of freezing determines the colour of the flesh according to the quality of the ice crystals formed in the tissues during freezing.

HEAT INTO ELECTRICAL ENERGY

Soviet scientist Abram Joffe is convinced that before the end of 1965 it will be possible to develop thermo-elements made up of gaseous semi-conductors with an efficiency of 50 to 70 per cent. He stated this when speaking at the recent plenary meeting of the central committee of the C.P.S.U. about the work done by Soviet scientists in the field of transforming heat into electrical energy by means of semi-conductors. Academician Joffe, director of the U.S.S.R. Academy of Sciences' Institute of Semi-conductors, said that U.S.S.R. scientists have developed thermo-elements which, by utilising temperature differences, generate electricity with an efficiency of 8 to 15 per cent. He stated that the science of semi-conductors in the U.S.S.R. was still young but had already made some important discoveries. Stressing that thermal elements with a high level of efficiency could bring about a real revolution in refrigeration, he said that with the help of semi-conductors it would be possible to obtain the required below-zero temperatures without expensive machinery.

F.B.I. Conference

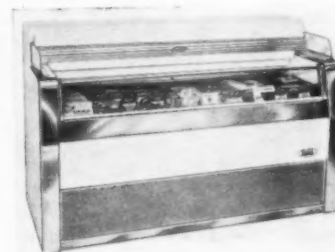
(continued from page 945)

a growing realisation amongst F.B.I. members that the 23,000 small U.K. firms, which employ 39 per cent. of the industrial labour force, must step-up their drive for technological progress if they are to succeed against growing competition from overseas. It is felt that those which fail to ensure technical and executive managerial continuity and planned expansion may face grave difficulties.

* * *

NEW RANGE FROM SWEDEN

A wide range of chest type and upright freezers, ice cream cabinets and frozen food merchandisers is now marketed in the U.K. by **Helimatic Ltd.**, of 22, Buckingham Palace Road, London, S.W.1. Included in the series is the deepfreeze display case of 17.5 c.ft., below.

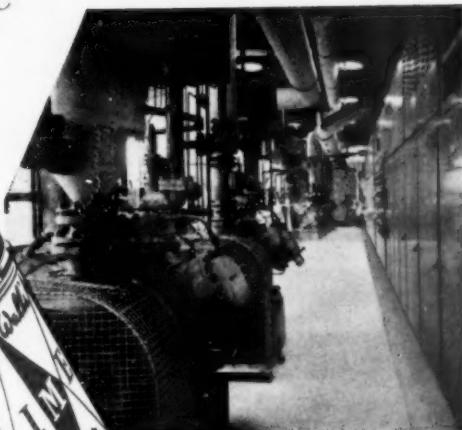




again choose

LIGHTFOOT

Refrigeration...



Photographs by courtesy of T. Wall & Son (Ice Cream) Ltd.

for their huge new factory at Gloucester which, when completed, will be the most advanced ice cream production unit in the world.

The first phase of this new project was completed when the 600,000 cu. ft. ice cream storage room, seen in our left hand illustration, was put into operation recently. This room is cooled by ducted air circulation and is served by 20 steel finned, Glycol Defrost Coolers and 6, semi-radial, Model A56 Compressors.

During sixty years of association, Lightfoot have supplied refrigeration equipment to this famous company for over 100 cold stores including the 300,000 cu. ft. room at Craigmillar, Edinburgh and the new Acton Cold Store of 430,000 cu. ft.

THE LIGHTFOOT REFRIGERATION CO. LTD. ABBEYDALE RD. WEMBLEY, MIDDX. Tel: PERivale 3322





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*There is a grade of Lustrex for *every* job in polystyrene.

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to bring a
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Shandon Scientific Co. Ltd., 6, Cranwell Place, London, S.W.7, have recently introduced a new range of completely self-contained, portable temperature and operation recorders designed to cover a wide field of applications in industry and in the laboratory. Models are available for recording ambient temperature, for remote temperature recording, for operation recording (e.g. the on/off cycling of electric heaters, fans, etc.) and for the simultaneous recording of both temperature and operation. These new "Tempscribe" recorders follow the modern trend towards miniaturisation of instruments, and measure only 5½ in. wide by 4½ in. deep by 7½ in. high. They consist basically of two parts—the bakelite case containing the spring-driven clock mechanism, and a front panel or "door" carrying the pen and actuating mechanism. For recording ambient temperature, the door contains a bimetallic element. For remote temperature recording, a bulb-type element is connected to the door by

6 ft. of flexible capillary tubing (a special model with 10 ft. of tubing is available for biological refrigeration work, such as recording storage conditions of vaccine, serum, etc.); while for operation recording the door carries an electro-magnetic



COMMERCIAL AND INDUSTRIAL

armature for parallel connection to the circuit concerned. The door for the temperature/operation recorder contains both a bulb-type element and an electro-magnetic armature, each actuating a separate pen. An important feature of "Tempscribe" recorders is that the doors are interchangeable and, within certain limits (imposed by the rotation time of the clock mechanism), any recorder can be converted to perform a different function—e.g. a temperature recorder may be converted to record over a different temperature range or to record electrical operations. Prices for complete recorders range from £29 7s. 6d. for the ambient temperature recording model to £44 1s. 6d. for the biological model. These price differences arise from the varying cost of the doors. The case with clock mechanism, irrespective of the time period, costs £15 7s. 6d. Charts cost 34s. per 100.

ASTRAL BUILT-IN REFRIGERATOR

TO meet the growing British demand for a built-in refrigerator for installation particularly in fitted kitchens, Morphy-Richards (Astral) Ltd. have increased production of their A.160 model which they are now introducing on the U.K. market.



The Astral A.160.

This model has a storage capacity of 1.6 c.ft. and a shelf area of 3.1 sq. ft. It retails at £35 10s. 0d. (net list £29 18s. 5d., plus P.T. £5 11s. 7d.).

A bottle shelf and egg rack are incorporated in the door-interior. Two ice-trays for making 24 cubes (1.1 lb. of ice) are provided in the cooling unit, which can alternatively store up to 4 lb. of frozen foods. There are also two steel wire shelves and a polystyrene drip tray. The cabinet exterior and the two ventilator louvres are finished in either white or cream stove enamel, while the interior door and shell is finished in light blue high-impact polystyrene. External dimensions of the cabinet, including the louvres, are approximately: height 31 in., width 21 in., and depth, including the handle, 23 in. Weight is 75 lb.

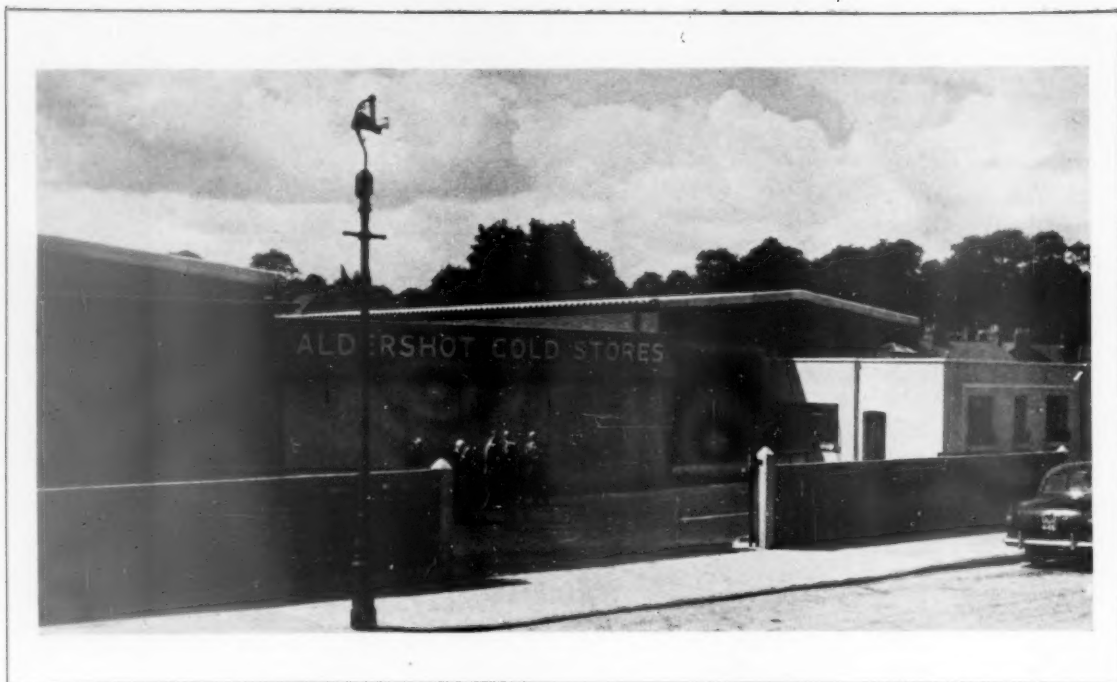
The model incorporates an absorption cooling unit and is thermostatically controlled.

WALTHAMSTOW STORE

(continued from page 923)

at the beginning of September 1959, and occupation of this building commenced at the end of February 1960.

The project was designed by Hal Williams and Company, architects and consulting engineers. The building contractors were Charles R. Price, and the refrigeration work carried out by L. Sterne & Co. Ltd.; the insulation by W. A. Taylor Ltd. and the clerk of works was Mr. E. G. Burr.



Aldershot Cold Stores Transformed

**PORTSMOUTH COMPANY ADDS
67,000 C.FT.**

MODERNIZATION and expansion of its cold stores at Newport Road, Aldershot, has recently been completed by Portsmouth Cold Stores Ltd., which is associated with Lightfoot Cold Stores Ltd. The new capacity totals 67,000 c.ft. and comprises one building with two chambers of 32,000 c.ft. and 35,000 c.ft., respectively.

The walls of the store are 16 in. cavity brick work with 9 in. inner skin, 2 in. cavity and 4½ in. outer skin and lined internally with 8 in. of cork slab, finished with polar white plaster with timber dunnage fixed vertically from 6 in. above floor to approximately 12 in. from the ceiling. The roof is formed with light steel trusses covered with corrugated asbestos sheeting and the ceiling is formed with timber bearers between the trusses and lined on the underside with flat asbestos sheeting. This is covered with 8 in. of cork and finished with polar white cement.

The walls and ceilings were vapour-sealed before the application of the cork. The ceiling is covered

on the upper surface with Rocksil blanket to give increased insulation value to the ceiling, one super-freeze type door is fixed for access to each cold chamber, and a Miniveil is fixed to each opening.

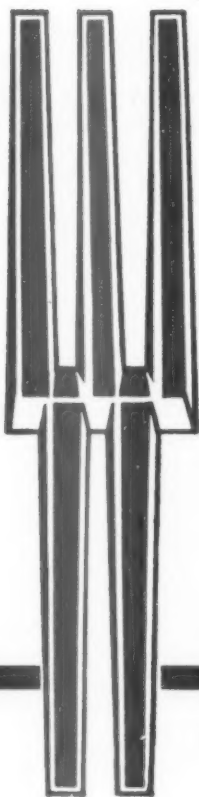
The refrigeration plant serving the two chambers is fully automatic and comprises two 45 h.p. "Lightfoot Ammonia N.V.6" compressors capable of maintaining sub-zero temperatures when required. At the present time one chamber is being operated at minus 5°F., whilst the other is maintained at 14-16°F. The cooling system is by air circulation through ceiling ducts from five standing unit coolers of the flooded gravity fed type with extended surfaces incorporating hot gas defrosting.

Space has been left in the engine room for the installation of a third compressor as and when the third chamber is developed on the site between the two existing buildings.

Internal lighting is with Crompton Parkinson fluorescent tubes. The general contractors were Caesar Bros., of Aldershot.

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Kelvinator specialize in refrigeration
equipment for:



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DISPLAY COUNTERS

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**AND THE LATEST APPLICATIONS
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* Individual branded items for quantity production will be quoted.

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Advances in REFRIGERATED VAN CONSTRUCTION

CONTAINERS for the transport of frozen food products are an important link in the chain of this rapidly developing industry.

Messrs. Caffyn's of Hove, have now launched a number of the latest design of refrigerated insulated bodies which are being operated by Messrs. Evershed & Son, Ltd., of Shoreham-by-Sea.

The accompanying photographs illustrate the arrangement of these bodies, with a refrigerating machine compartment forward behind the driver, and all access at the rear.

These bodies have been manufactured by the insulating concern who have specialized in this type of work for over 50 years—W. A. Taylor, Ltd., of Mitcham, Surrey—and they have provided, by arrangement with Messrs. Caffyns, Lightfoot automatic refrigeration equipment connected to Winget Dole plates.

Each vehicle is cooled overnight by two 1 h.p. hermetically-sealed, air-cooled, condensing units

newest development of travelling shops for frozen foods.

The background to this new development is control, and it is worth while bearing in mind that new conceptions of the requirements of the frozen food distribution trade have developed from early experience.

It has always been apparent that, provided the frozen product has been adequately processed and carefully handled from processing plant to buffer stores, with buffer stores skilfully operated and capable of low temperatures, together with some duty on softened products, then in the last analysis the condition of the product in the hands of the retailer, and so to the consumer, rests in proper and adequate safeguards within the wholesale distributive trade, on the road.

These safeguards lie mainly in holding the product in as nearly as possible the same condition as received from the processing plant.



A view of the vehicle discussed in this article.

which are fully automatically controlled and operate on "Arcton-12."

Each machine is connected to three eutectic filled holdover plates each measuring 30 in. by 60 in. by 1½ in. thick, and total six plates in all.

These bodies represent a definite advance in the technique of frozen food handling, and go a long way towards solving the problems inherent in time and distance, as well as providing a solution to the

The principle to which all distributors subscribe is that whereas a product may gradually be allowed to rise in temperature, it may not be allowed to soften and then harden again without doing so at the expense of flavour, texture, and colour.

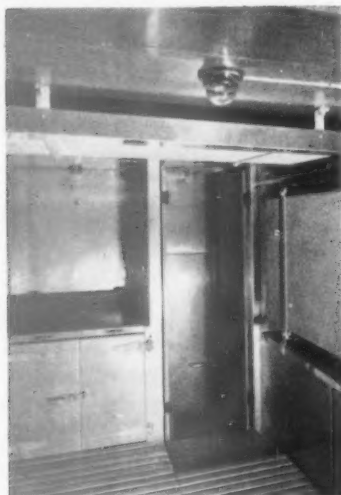
Handling within Evershed's premises is under rigid control, and the management are able to assure themselves that nothing untoward can happen to the product while it is under their roof, but en route

from the wholesaler's premises to the retailer, with perhaps 50 "drops" in a 10-hour run, a good deal can happen which may vitally affect the condition of the product when it is in the hands of the retailer.

Retailers are often a very mixed bag, and while some may have installed deep freeze units of modern design, operating at the correct temperature levels, others may be said to operate "on a shoestring," so that at any rate they depend absolutely on the conditions in which they receive the product as to what state it is in when it arrives at the cooking pot or on the table.

In the range of products handled by wholesalers there is a great variation in the latent heat factor, which amounts to the latent heat run of the ice formed of the water in the product, and mixed loads under indifferent control are something of a hazard unless very skilfully arranged in the body.

However this may be, there is obviously no substitute for careful handling and control, whatever the product may be, so that at least the wholesaler can



The service "boot" can be seen in this illustration, lower left. The main door is to the right of this.

be confident that if anything goes wrong he knows where the fault lies, and the factor can be corrected without great expense or loss of goodwill.

In order to encompass all these requirements it is necessary to have first of all an adequately constructed and scientifically insulated body with a "method" built into it, whereby the operator does not enter the body, thus allowing cold air to fall out, any more than is avoidable.

Mr. R. Saunders of W. A. Taylor, Ltd., Mitcham, the builders, has developed a simple system whereby a locker or "boot" is built into the rear of the body of a capacity which may be capable of holding six or seven "drops," so that the operator may in some circumstances only need to enter for 50 "drops" some seven times, instead of 50 times, as in a normal body. The advantages of this reduction in the loss of cold air are obvious, especially when it is realised that the refrigeration plant on board the vehicle, together with the holdover evaporator plates, are not by themselves capable of doing more than maintaining

the temperature of the vehicle against the ingress of heat, plus a limited loss of cold air.

Therefore, it is important for distributors to realize that refrigeration plant and holdover plates, or any other method such as the use of solid CO₂, do no more than support a system of rigid control which eliminates unnecessary air changes and losses through the insulation.

Insulation

The type of insulation used is again important, because it has been proved that some very lightweight types of insulant, sometimes carelessly thrown together, do not give the protection needed, and if the vehicle is subjected to relatively stiff winds while in progress on the road, plus standing for longish periods in the sun, a very lightweight insulation alone will allow a considerable rise in temperature.

Experience since early days has resulted in unanimity in the refrigeration industry and the frozen food distributive trade, in that the only reasonable type of equipment to carry is that which embodies the minimum weight consistent with effective operation, and which can be plugged in at various points to recharge the eutectic liquid in the holdover plates.

It is also important to bear in mind that the eutectic liquid is incapable of serious work if subjected to rapid warm air change across the surfaces, and that there is no substitute for protecting the holdover plates against the ingress of warm air from any source.

Summarizing this new body, it is constructed with aluminium alloy on a light, specially selected, timber framing, coach built, and thoroughly sealed inside and out. The outside is adequately weathered with a sun roof having an air space underneath, and the insulation comprises 5 in. of kapok and 1 in. of cork to the floor, walls and ceiling, all sealed with a special filler material and arranged in a special order.

The "boot" is also at the rear and has an insulated plug opening on to the road, and a lift-up lid inside from which the operator fills the "boot." A small pair of plugs are fitted inside the "boot" to line up with the outer plug for conveyor loading.

We understand from Mr. Saunders that his patents have been granted for a combination of the "boot" and the canopy, or the "boot" alone, in a number of countries, and that this is under consideration by a number of others.

W. A. Taylor, Ltd. are the main agents for the patentees and owners and have the sole rights, and no other persons or companies are concerned.

Licences will be granted for local manufacture, and it is obvious that the canopy type of door is eminently suitable overseas, where operators find it uneconomic to use European drivers, and it is practically impossible to persuade native drivers to shut the doors each time.

For the benefit of the bodybuilding trade we have been asked to state that W. A. Taylor, Ltd. are not proposing to trespass on the legitimate interests of their friends and competitors, and are willing to consider making the rear end themselves at Mitcham for coupling on to existing or new bodies made by others, or alternatively to grant licences and supply technical advice for others to make the whole body.

**Don't worry,
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All over the place—in town and
country—more and more people
are relying on refrigeration by

STERNE



Illustrated here is just another typical Sterne job. This complete automatic plant for Cow and Gate Ltd. at their Bristol Creamery, comprises two Mark 4VQ Ammonia Compressors with a capacity of 146 tons of refrigeration, cooling water to 35°F.

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NEWCASTLE	<i>Newcastle 66-1048</i>
HULL	<i>Hull 31198</i>
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DUBLIN	<i>Dublin 71316</i>
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1/1895

"The Biggest Deep-Freeze in the World"

This is what the technicians call the immense American cold store near Kaiserslautern, West Germany.

The huge plant can store well over one million cubic feet of goods. About a quarter of a million turkeys were stored there for the American Thanksgiving alone – and

*helped to keep these delicacies fresh. Large areas of the 625 ft long cold store are insulated with over 325 000 sq ft of **STYROPOR** foam sheeting.*

*With a thermal conductivity of 0.0181 BTU/ft h °F at 32° F **STYROPOR**, the plastics foam based on polystyrene, is one of the most effective insulating materials known. It is very light (down to 1.25 lb/cu ft), unaffected by vibration (this is important in the insulation of road and rail transport), resistant to acids, alkalis and brine, and rotproof. **STYROPOR** foams have no capillary action; their insulating properties are therefore not reduced in humid environments.*

This material is employed as an insulant for all kinds of cold stores, refrigerators and refrigerator vans, roofs, air conditioning plant, chilling apparatus and piping for carrying chilled liquids.

*The raw material **STYROPOR** is supplied by BASF. We will gladly put you in touch with firms producing **STYROPOR** foams.*



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REFRIGERATION AND WATER-CRESS GROWING

BECAUSE of its highly perishable nature, watercress suffers more wastage during transit between grower and consumer than other leaf vegetables. This is particularly evident during the warmer months when the crop quickly wilts and loses colour. To reduce this wastage and to ensure the arrival of a fresher produce at the market, increasing interest is being shown in the employment of refrigeration and the installation of hydrocooling plants at the packing station.

The latest grower to use hydrocooling in its preparation is Isaac Bros., Alresford, Hampshire, whose plant was designed and installed after considerable research and tests by Scott and Scott (Bournemouth) Ltd., distributors for York Shipley Ltd., in association with S.C.A.T.S., Winchester, who were the main contractors for the construction of the packing station and other engineering services. The plant, which incorporates a high degree of mechanical handling, comprises a tank in which cooled water is circulated; equipment for lifting the cooled produce from the water, and a cold room for storage. It has been designed on a continuous flow principle,

the process being linked by roller conveyors, and is based on recommendations made by time and motion experts in consideration of the required throughput.

The watercress, grow in artesian water in fields which are carefully laid out to give the correct fall, is gathered by skilled pickers and placed in baskets or tubs, and transported to the packing and process shed. This building is in four main sections: the unloading bay is at one end; offices and stores at the other, while the rest of the building is divided down the centre, operators preparing the watercress on one side, and the cooling plant and store on the other.

After being washed, trimmed, bunched and packed into chip baskets, the watercress is placed on an inclined conveyor which takes it through a trap hatch into the cooling section. An operator places the tops on the chips, and transfers them to a further conveyor where they slide by gravity into the hydrocooling tank.

Basically the hydrocooler is an open top tank with a horizontal baffle separating the top from the bottom. Cooling is by the ice-bank principle incorporating a York 1½ h.p. Refrigerant 12 condensing unit, the coils being located in the lower section. Water is drawn from this lower section by a 1 h.p.

The York Shipley hydrocooling unit installed at the watercress plant at Alresford, Hampshire, of Isaac Bros. Chips of watercress pass through the tank three abreast propelled by water jets. The operator, right, is putting lids on the chips as a final operation before cooling.



Worthington Simpson Monobloc centrifugal pump, and discharged through sprays directly on to the chips of water-cress floating beneath. The water is returned for re-cooling through removable fine mesh screens. Any water loss is compensated for by a header tank mounted at the end.

The chips pass down the tank three abreast, guided by rails and propelled by water jets directed from behind. When they reach the end of the tank, they are lifted out by a power-operated elevator, specially designed and built by Scott & Scott (Bournemouth) Ltd., and mechanically assisted down a roller conveyor into the cold store. The process through the tank and into the store is, therefore, entirely automatic.

Cold Store Design

In designing the cold store consideration had to be given to the respiration of the water-cress. Furthermore, since water-cress will dehydrate rapidly, a high rate of humidity had to be maintained.

Although the room is not more than 900 cu. ft. capacity, two unit coolers were installed across the width of the room to reduce air velocity to a minimum. Standard York R5F ceiling mounted forced draught type coolers were used, connected to a Yorkometric sealed type condensing unit.

The cold store is insulated with 4 in. polystyrene on the walls, and 4 in. cork on the floor. It is finished



Air velocity in the cold room is reduced to a minimum by installing two York unit coolers across the width.

internally and externally with galvanized steel sheet. Unloading takes place through a hatch to a vehicle outside, final delivery is made by train to markets in various parts of the country.

Advantages of hydrocooling have already been proved by considerably increased demand experienced by this grower. Apart from benefits to the distributor and consumer, certain economies can be gained by the grower using short term storage which enables labour to be employed evenly during the week, yet able to handle the heavier end-of-week loads.

The ability to offer leaf vegetables for sale in field-fresh condition results in a better price to the

grower, wholesaler and retailer alike. Losses due to trimming are minimized and the more attractive appearance of the produce at the retail outlet results in increased consumer demand, greater sales and bigger profits.

RESEARCH FOR INDUSTRY INCREASING

D.S.I.R. Report

GRANT-AIDED research associations—which last year reached a total number of 50 for the first time—are keeping pace with the increasing research effort in industry generally. The total income from industry and government rose from £5.1 million in 1955 to 7.3 million in 1959, of which the Department of Scientific and Industrial Research contributed £1.7 million last year. "We expect it to go on rising", states the Industrial Grants Committee of the Council for Scientific and Industrial Research, in their report "Research for Industry 1959", published last month.

All types of activity—basic, applied and sponsored research, and development, information and advice—are benefiting from this expansion, although each research association is designing its own pattern of advance to meet the changing needs of its industry.

Institute of Refrigeration Bulletin

(continued from page 934)

council wishes to place on record its sincere appreciation of the work of Colonel H. Randal Stewart, who has occupied the office during the past two years and has devoted so much time and thought to the affairs of the Institute.

Honorary Treasurer

"Mr. T. A. Raymond has continued in office as honorary treasurer during the past year and the members of council wish to express their sincere appreciation for all the time and effort he has devoted to the affairs of the Institute.

Council Elections

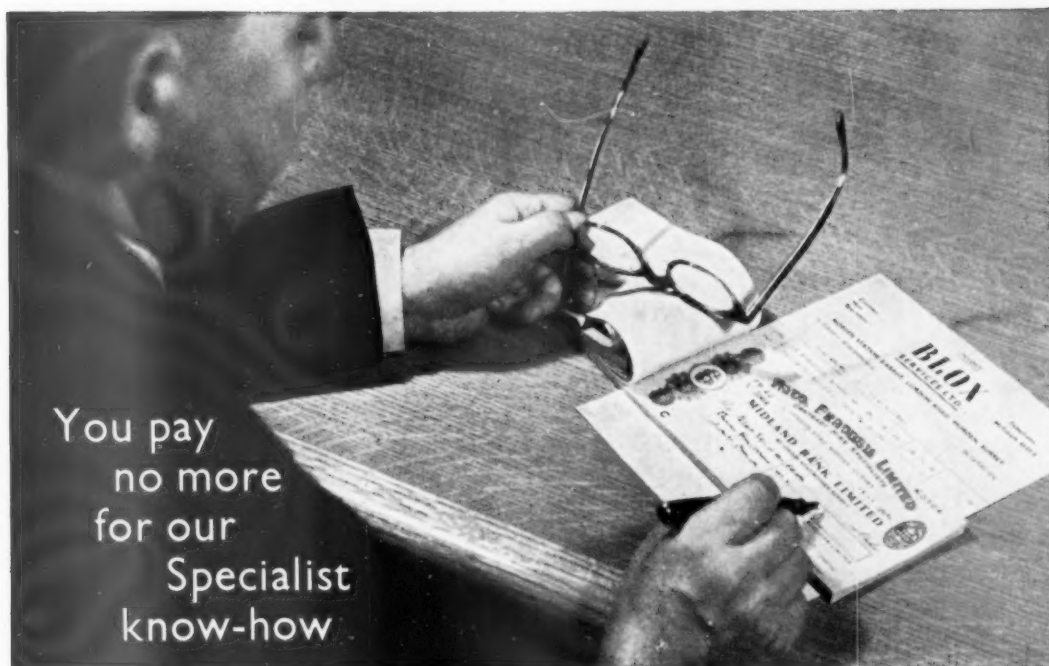
"The members of the executive council retiring under By-law 10 on March 25, 1960, were Mr. J. Douglas, Mr. K. C. Hales and Mr. H. R. Howells, Corporate members, and Mr. R. H. R. Lloyd, companion.

"The election to fill the vacancies for Corporate Members resulted in the appointment of Mr. K. J. R. Cocke, Mr. W. B. Gosney and Mr. R. W. Griffin. As there were no other nominations for the vacancy for a representative of the companion class of membership, the council's nominee, Mr. K. R. Billinge, was declared elected to fill the vacancy.

Lightfoot Medal

"The fourteenth annual award of the Lightfoot Medal for 'the best paper of the session' was made to Dr. H. J. Goldsmid, B.Sc., for his paper entitled 'Thermoelectric cooling,' which he read at the meeting of the Institute held on February 5, 1959."

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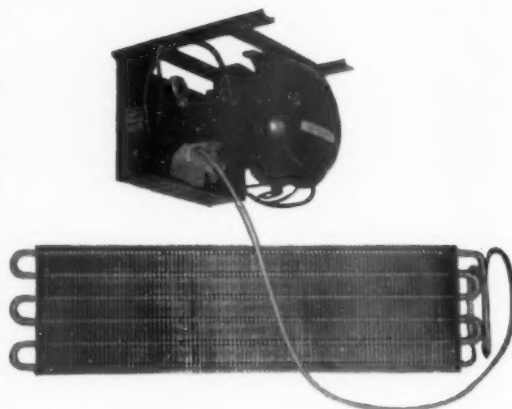
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ANTICIPATOR FOR HEAT PUMPS

H EAT PUMPS manufactured by the Westinghouse Electric Corporation are the first to be equipped with an "anticipator" that provides advanced warning of outdoor temperature changes and assures closer temperature control within the home.

The instrument is now being included in all of the Westinghouse split-system heat pumps — with nominal 3, 5 and 7½ tons of capacity—at no increase in cost.

Use of the anticipator, it is claimed, reduces the temperature fluctuation in a home from the average of four degrees Fahrenheit to a more comfortable range of about two degrees.

The new feature consists of an outdoor "sensing device" connected to the indoor thermostat. When the temperature changes appreciably outside, the thermostat receives advance warning and regulates the operation of the heat pump accordingly.

Another new device fitted to these heat pumps is the "Precipitron" which cleans the air electronically, eliminating 95 per cent. of the airborne particles including micro-organisms, bacteria, pollen, and other foreign material often responsible for asthma and allergies such as hay fever.

The directors of Ross Group Limited have declared an interim dividend of 6 per cent.—six—actual, less tax, on the ordinary stock of the company on account of the year ending September 30, 1960. This dividend will be paid on September 7, 1960. The transfer books will be closed from August 27 until September 7, 1960, both dates inclusive.

PATENTS

APPLICATIONS RECEIVED

May 31—Sowerby, P. E., P19204, Ice making machines. June 9—Centre Nationale de Recherches Scientifique, C20382, Freeze drying, etc. processes. 15—Little Inc., A.D., C20992, Refrigeration apparatus, etc. 16—Lewis, F., P21111, Electrical air-conditioner. 21—National Cash Register Co. C21700, Refrigerating apparatus temperature indicating method. 22—Carrier Engineering Co., Ltd., and Justham, R. R., P21921, Absorption refrigeration systems. 23—General Motors Corporation, C21969, Refrigerators. 24—Bitumen Industries Ltd., Butler, D. S., P22187, Cold stores insulation method; Junella Foods Ltd., Davison, H., P22121, Frozen fish defrosting. 27—Oatley Technical Developments Ltd., Oatley, A. F., P22532, Cooker/refrigerator. 28—Craigton, A. P22540, Refrigeration means; Geddes, A. C., and Corlett, E. C. B., P22580, Thermal, etc. insulating materials.

COMPLETE SPECIFICATIONS ACCEPTED

June 22—English Electric Co. Ltd., 844,938 Electric refrigerator motor-compressor units; United Aircraft Corporation, 844,863, Air-conditioning system for air-

craft; Rivoche, E. J., 845,028, Frozen food patties and method of preparing same; Weatherfoil Heating Systems Ltd., and Dawson, H. L., 844,876, Air-conditioning apparatus; 844,877, Refrigerating and air-conditioning apparatus; Electrolux Ltd., 845,249, Absorption refrigerating apparatus; Garrett Corporation, 844,586, Refrigerating systems. 29—Dobsons Dairies (Belfast) Ltd., 845,749, Methods of and apparatus for use in freezing liquid food products to block form; Philips' Gloeilampenfabrieken, N. V., 846,115, Cold gas refrigeration apparatus; Minikay A. G., 846,123, Insulation of refrigerated chambers on board ship; Richelli, F., 845,576, Moulds for ice blocks; Eskimo Pie Corporation, 845,968, Frozen aerated dessert with a wrapper and stick and method of manufacture; General Motors Corporation, 845,479, Ice-block release arrangement.

July 6—English Electric Co. Ltd., 846,264, Electric refrigerator motor-compressor units; Campbell, A., 846,972, Heating or air-conditioning systems; Pressed Steel Co., Ltd., 846,405, Thermally insulated cabinets; Sulzer Freres S. A., 846,845, Low-temperature cooling apparatus; Fram Corporation, 846,458, Air-conditioner filter having germicidal properties. 13—General Electric Co., 847,503, Closure sealing means for cabinets particularly refrigerator cabinets; Babcock & Wilcox Ltd., 846,977, Thermal insulation; Pressed Steel Co. Ltd., 847,293, Refrigerators; Bayston, J. R., 847,468 and 847,469, Ice-making machine; Brodrene Gram, A. S., 847,207, Refrigerating apparatus for preparing frozen bodies of ice cream.

New Companies

The accompanying particulars of New Companies recently registered are taken from the Daily Register compiled by Messrs. Jordan and Sons Ltd.

Retailers Marketing Co. Ltd. To carry on business of general selling agents, dealers in and hirers of refrigeration equipment, etc. Nominal capital: £5,000. Directors: to be appointed by subscribers. Solicitors: Latimer, Hinks, Marsham and Little, Darlington.

James Nash & Co. Ltd., 6 Gate Street, Lincoln's Inn Fields, W.C.2. Secretary: Jean C. Warner. To carry on the business of heating, ventilating and air-conditioning engineers and contractors, etc. Nominal capital: £2,000. Directors: Ronald J. Nash, 34 Ferney Road, East Barnet, Herts; Jack F. Warner, 11 Frogmore Grove, Blackwater, Near Camberley, Surrey.

Refrigeration S. & B. (Grimsby) Ltd., Kidgate, Louth. Secretary: T. A. Baker. Nominal capital £100. Directors: Edwin J. Snelling, 9 Kidgate, Louth; Thomas A. Baker, 25 Southlands Avenue, Louth.

Domestic Refrigeration Co. Ltd., 27 Chesterfield Road, Sheffield, 8. Secretary: M. Elcock. Nominal capital: £1,000. Directors: James W. Lee, 44 Jaunty Avenue, Sheffield, 12; Mrs. Sylvia P. Sanderson, 3 Highfields Crescent, Hilltop, Dronfield.

Southern Marketing Co. Ltd., 26, Princes Street, Yeovil, Somerset. Secretary: Geo. A. Wheatley. To carry on business of manufacturers of and dealers in refrigeration and allied trades, gramophones and sound reproducing machines, etc. Nominal capital £100. Directors: Wm. G. Wheatley, 3 New Close, Haselbury Plackett, Crewkerne, Somerset (ch); Geo. A. Wheatley, 37 New Close, Haselbury Plackett, Crewkerne, Somerset.



With Special Reference to the

Bulletin of the International Institute of Refrigeration, No. 3 1960

Reviewed by DR. EZER GRIFFITHS, Hon. President of the I.I.F.

"Physical and Biochemical Changes in Products Subjected to Freezing" was the topic of the main session at the recent Polish Congress of Refrigeration. Some 600 people attended this gathering which is reported in full in the I.I.F. Bulletin. Reports on the research activities of laboratories in various parts of the world include those from: the Division of Food Preservation, Homebush, Australia, the Fisheries Research Board of Canada, the Centro Experimental de Frio, Madrid, Wageningen, Holland, and the National Bureau of Standards, Washington.

Abstracts in this issue are grouped under 10 main headings. References are made to works concerning the temperature scale, a low temperature thermal noise thermometer, methods of computing power by reference to hypothetic indicator diagrams, a cross-flow cooling system (dealing with a case where water flows through tubes while air flows across them), compressor design and labyrinth compressors, spray condensers, cooling towers, determination of the mean enthalpy differences of air in a cooling tower and air washer calculations, humidification plants with a Manters type contact surface, thermoelectric generation in refrigerating machines, insulating materials, the measurement of cold losses through a cold store wall over many years, top-opening freezers in domestic refrigerators, fruit cold

stores, construction of cold stores for farms and locker plants, air conditioning installations and heat pumps, snow icing machines applied to refrigerated transport, refrigerated transport by air, the automatic control of air separating units, a new unit for producing oxygen and nitrogen, and expansion engines for hydrogen liquefiers. Other works which are abstracted concern technical safety measures for the storage and the processing of liquified gases, the analysis of milligram quantities of hydrogen sulphide in the presence of carbon dioxide, the formation of ozone from atomic oxygen at low temperatures, refrigeration in dam construction, a portable ice rink made of pre-fabricated aluminium integrated tube-sheet elements, effects of gamma radiation dose, rate, and temperature on the storage life of certain fruits, vegetables and their products, microbial flora developing on refrigerated beef, preservation of frozen poultry by a hot melt resin coating, and a number relating to fish topics.

A number of books have recently been received in the library of the institute. Of particular interest amongst these is a Russian volume on the "Technology of Meat and Meat Products." The Proceedings of the 8th National Congress of Refrigeration, held in Padua in 1959, also received, contains the texts of the 24 papers read.

BOOK REVIEW

MECHANICAL PROPERTIES OF STRUCTURAL MATERIALS AT LOW TEMPERATURES—A COMPILATION FROM THE LITERATURE, by R. M. MCCLINTOCK and H. P. GIBBONS, National Bureau of Standards Monograph 13, issued June 1, 1960, 180 pp. Obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

Intelligent design of reliable cryogenic equipment requires data on the mechanical properties of structural solids at low temperatures. This Monograph is issued to help fill

the need for a compilation of useful design figures. It includes tensile strength, yield strength, tensile elongation, and impact energy of about 200 materials, metallic and non-metallic, given graphically as functions of temperature between 4 to 300°K. The advent of space vehicles which utilize cryogenic fluids for propellants has greatly increased activity in the field of cryogenic engineering in recent years. Large-capacity gas liquefaction plants have become necessary to supply cryogenic fluids in the amounts needed for rocket testing. With these plants and the rockets themselves, has come the need for associated cryogenic equipment, such as valves, pumps, liquid transfer lines, flow indicators, pressure switches, temperature and level-sensing devices, and, in fact, all the equipment used in handling liquids at other, more convenient temperatures.

Professor V. V. Parin, director of the Institute for Natural Pathology and Physiology in Moscow, and three colleagues, Dr. V. V. Guzoff, Dr. K. P. Vezno and Mr. V. A. Klukachol, visited Cambridge on Wednesday, July 27, as guests of the Cambridge Instrument Co. Ltd. and the Department of Physiology at Cambridge University. The professor, who is also a full-time member of the U.S.S.R. Academy of Medical Sciences and speaks English, German and French, spent the morning in the company's research laboratories and factory where he and his colleagues were able to see working demonstrations of numerous medical, industrial and biological instruments, including

some made by the company's new associate, Electronic Instruments Ltd., of Richmond, Surrey. Professor Parin was particularly interested in the Huxley ultra-microtome, an instrument used for cutting very thin sections of biological tissue for examination under electron-microscopes. Another instrument of interest was a fully transistorised portable cardiograph that can be used not only for routine work in hospitals and clinics, but also for on-the-spot diagnosis under difficult conditions, such as in the patient's home, in factories, or even on the side of a mountain. The professor thought it was particularly suitable for use in the Soviet Union, with its vast territories and extreme differ-

ences of climate. A visit to the Department of Physiology in the afternoon was arranged at very short notice by Dr. M. C. Marsh, the Company's Head of Research, and Dr. G. S. Brindley of the Department of Physiology.

* * *

Siebs, Gorman & Co. Ltd. announce that their mark 4 compressed air breathing apparatus has been granted the approval of Her Majesty's Chief Inspector of Factories under the Chemical Works Regulations, 1922. The mark 4 compressed air breathing apparatus has been supplied to several fire brigades and also to the Atomic Energy Authority.

BUYERS' GUIDE

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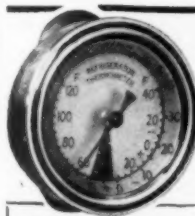
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MEAT

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Mr. T. F. MEAD RETIRES

AFTER a lifetime of distinguished service to the refrigerating and general engineering industries, most of which was spent with Hal Williams and Company, 43 Bedford Square, London, W.C.1, consulting engineers and architects. Mr. Thomas Francis Mead has retired from the company. Mr. Mead, whose work on supervising and inspecting the



southern group of Government cold stores built during the 1939-45 war will be well remembered, was educated at Monoux Grammar School, Walthamstow, and at the Bournemouth Grammar School.

In 1897 he joined H. Pontifex and Sons and served an apprenticeship in their shops and drawing office on refrigerating plant. From 1905 to 1907 he gained experience of boiler-making and agricultural engineering in the drawing office of Clayton and Shuttleworth, joining Hal

Williams and Bridges in 1907 as a mechanical engineer. From 1910 to the outbreak of the First World War, Mr. Mead was with Hal Williams and Co., also a mechanical engineer.

Twice mentioned in despatches, Mr. Mead served throughout the war as an Inspector of Ordnance Machinery in the field and at G.H.Q. In 1919 he returned to Hal Williams and Co., and did valuable work in the cold store realm.

Remaining with the company, he was appointed to its board on the death of Mr. Hal Williams in 1943, resigning his directorship in 1952. He has since served the company in a consultative capacity.

HOOVER LIMITED

INTERIM dividends of 3d. per share less income tax on the company's ordinary and "A" ordinary shares, have been declared by Hoover Ltd. The group net profit for the first half of the current year shows a considerable decrease against the corresponding period of last year, and, although profit for the first six months was substantial, the months of May and June were markedly affected by the reimposition of hire purchase controls on April 29. This is clearly shown from home market turnover which for the first six months is down by 13½ per cent, but for the above two months is down by 35 per cent. compared with last year.

"It is extremely difficult" states the company "to forecast with any degree of accuracy what our results will be for the second half of the year, but the general indications do not show any appreciable

improvement from the present difficult conditions. However, despite this set-back in the home market, with its inevitable adverse effect on profits, we are continuing to pursue as vigorously as ever our long term plans of development and expansion in both home and overseas markets." Group net profit before taxation for the 6 months to 30th June 1960 was £4,013,000, which compares with £5,650,000 in the corresponding period of 1959.

DIFFICULT CONDITIONS SURMOUNTED Chambers Wharf Report

FOR reasons beyond our control, the completion of certain of the developments referred to in my statement last year, was delayed," states Mr. C. Goldrei, chairman of Chambers Wharf and Cold Stores Ltd. in his annual report. "The Walthamstow cold store did not come into operation until the beginning of 1960, too late to participate in the 1959 season for quick frozen food, and the new Riverside dry goods warehouse was not ready for use until the end of July. The acquisition of Sterling Wharf, after certain alterations thereto, has been a welcome addition to our storage facilities and at our riverside jetty there has been a notable increase in the number of ships worked and shipping tonnages handled; furthermore, since the end of March this year, the receipt of tonnage for dry goods storage has shown a considerable improvement.

"We are continuing to add to our riverside facilities by the erection of further cranes and other equipment.

"On the cold storage side, the demand for storage of quick frozen foods in the port area has decreased and this has coincided with a period of very low stocks carried by the frozen meat trade in the country, but it is envisaged that this position will improve in the next few months and that cold storage space will again be in demand. The night service operated at our riverside cold store since last year has proved a valuable contribution to our share in the meat trade."

Referring to the company's trading results, Mr. Goldrei said that during the past six months they had reflected the aftermath of the difficult labour conditions of 1957/58 and 1958/59, and although the lengthy unofficial strikes of these years were not repeated, they experienced labour stoppages from time to time, which interfered with their trading as a whole and added to their operational costs which latter had risen by 13 per cent. against a revenue increase of only 6½ per cent.

The net profit before taxation was £272,988 as against £295,029. Taxation on this profit has been relieved by investment and initial allowances to the extent of £39,020, of which £16,000 has been transferred to tax equalization reserve, thus leaving the net charge for taxation at £120,460 against £148,955.

The net profit after tax is £152,528 against £146,074 for the previous year. £54,965 has been transferred to general reserve which is now shown at £200,000 in the balance sheet, and a payment of

the same final ordinary share dividend as last year of 11½%, making 17½% for the period against 16½% last year is recommended.

The nature of our business is specialised and requires a high degree of capital employment in fixed assets. Further expenditure on fixed assets during the period absorbed some £460,000, which has been mainly financed by the fluctuating bank loan shown at £330,000 in the balance sheet.

FULL SCALE THERMOELECTRIC REFRIGERATOR

REFRIGERATING research scientists and engineers of Westinghouse Electric Corporation in the United States have recently developed the first full-scale refrigerator operating on the thermoelectric principle. Cooling for the various compartments, including the freezer, is accomplished entirely without the aid of any moving parts.



Supported by chrome-plated steel-legs, the unit has a capacity of nine cubic feet accessible through "French" doors. Additional space for frozen foods and vegetable storage are located below the counter space.

KELVINATOR DISCONTINUE K46MT

Kelvinator have ceased manufacture of their 4.6 cu. ft. refrigerator (K46MT) and are releasing the trade from resale price maintenance obligations on this model only. In announcing this decision Kelvinator emphasize that this is not a move on their part to break the resale price maintenance structure. In common with the rest of the refrigeration industry they believe strongly that price maintenance should be retained on models in current pro-

duction, and consequently, it is still effective on all their current models. A new and improved version of the discontinued K46MT is therefore to be produced and details will be released on November 1st.

PORTABLE THERMOELECTRIC DEHUMIDIFIER

REFRIGERATING research scientists of the Westinghouse Electric Corporation in the United States, have recently developed an entirely new type portable dehumidifier that has no moving parts yet keeps food fresh and protect furs against moisture damage, mentioning only just two applications of it.

The prototype of the new appliance that will probably be commonplace in the homes of tomorrow, uses the thermoelectric principle which produces cold direct from electricity with no compressor as is generally used nowadays.

In size, it is just a little larger than a compressor alone in standard dehumidifiers. Its designers envisage its use in keeping crackers, potato chips and similar items crisp in the cupboard and drying clothes' closets in humid climates.

The Union Castle Line's new refrigeration ship *Rothsay Castle* (9,650 tons) sailed from Port Elizabeth for Europe last week-end with a consignment of 8,575 tons (153,184 cases) of South African oranges on board. This is stated to be the largest consignment of the fruit ever loaded at that port, containing about 29,000,000 oranges.

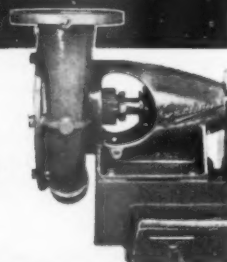
REVIEW

CRYOPHYSICS by K. MENDELSSOHN, F.R.S. viii + 182 pp. 8 in. x 5 in. 89 figs., six tables and four plates. Interscience Publishers, Ltd., London, 1960. Cloth 36s. Paper 20s.

This is number seven of a series of interscience tracts on physics and astronomy and is written by the head of the Clarendon Laboratory, Oxford. Its aim is to provide a reasonably short but comprehensive account of low temperature physics avoiding detailed treatment and unbalanced enthusiasm for current research. The level for which it is written is that of the last undergraduate or first graduate year.

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CAN I TRADE IN MY OWN NAME ?

By Lord Meston

OF course I can. Good gracious what is the country coming to if I am not allowed to use my own name when and how I like.

Wait a minute colonel—not so fast. Of course, you have a right to trade in your own name, but it is not an absolute right without any limitation.

Well, well, I suppose you lawyers have it every time. Tell me the worst as quickly as possible.

I will tell you, Colonel, in as few words as possible. The law lays down two propositions. First, no man shall carry on his business so as to represent it as the business of another. Secondly, no man shall describe or mark his goods so as to represent that they are the goods of another. Now to the first rule there is an exception. A man may carry on business in his own name, even if that causes confusion with another's business, provided he is honest and not fraudulent. But the second rule is a flat prohibition without qualification. Here it is the deception itself that is obnoxious to the law; the intent to deceive need not be proved nor is the honest use of a name a ground of defence.

It therefore becomes necessary to distinguish between where a person merely uses his own name for business and where he marks his good with his own name.

Thus, it is perfectly legitimate for a man in, say, the cutlery business to carry on business under his own name, whatever that may be, but if he marks his cutlery with a name (although it be his own name) which has the effect of passing off those goods as the goods of someone else, then a civil wrong may have been committed.

Similarity

As already indicated, a man, so long as he acts honestly, may trade under his own name, even though the similarity of such name to the name under which another person has previously been trading may occasionally lead to confusion or lead to the goods of the one being mistaken for the goods of the other trade.

Decisions on some cases which have actually occurred will prove the best way of illustrating these matters.

In *Turton v. Turton* (1889) the plaintiffs carried on their business under the name of Thomas Turton and Sons. The defendant, who carried on a similar business, and in the same town, under the firm of John Turton & Co., took his sons into partnership and then changed the name of the firm to John Turton and Sons. There was no evidence that the defendants did anything to represent their goods as the

goods of the plaintiffs. It was held that there was no ground for an injunction although it was shown that some of the customers of the plaintiffs purchased the goods of the defendants believing them to be those of the plaintiffs.

Passing Off

But a man may so mark his goods with his own name as to commit the wrong of passing off. In *Baume & Co. Ltd. v. A. H. Moore Ltd.* (1958), the plaintiffs Baume & Co. Ltd., and their predecessors had traded in England as distributors and sellers of watches for some hundred years. Since 1878 the word "Baume" had been the registered trade mark for the watches, and the plaintiffs were the registered proprietors of the mark. The defendants, A. H. Moore Ltd., began to import and sell watches made by a Swiss Company, known as Baume & Mercier S.A. The watches, and the boxes containing them, bore the mark "Baume & Mercier, Genève". The plaintiffs claimed that this use of the word "Baume" constituted an infringement of their trade mark (within S. 4(1) of the Trade Marks Act, 1938) and was calculated to pass off the goods sold by the defendants as the plaintiffs' goods. The defendants established that this use was an honest use by them of the makers' own name. It was held by the Court of Appeal that this use constituted a passing off which could be restrained by injunction because (a) there was a real probability that the watches marked "Baume & Mercier, Genève" would be regarded as being the same as, or in some way associated with, the plaintiffs' goods, and (b) no man was entitled, even by the honest use of his own name, so to describe or mark his goods as in fact to represent that they were the goods of another person.

The real question in each case is whether the use of the name is calculated to deceive the public unless precautions are taken. Thus, it may be proper to restrain a man from trading under any name of which his surname forms part, without clearly distinguishing his goods from those of some other trader.

In *Wright, Layman & Umnay Ltd. v. Wright* (1949) the plaintiffs, or their predecessors, had carried on the business of manufacturing pharmaceutical and toilet preparations since 1867, and they had acquired a wide reputation with the trade and public under the name "Wrights" in connexion with this class of goods. Their principal product was "Wright's Coal Tar Soap", but the style Wrights was also used on other goods including talcum powder. The defendant commenced to sell toilet preparations about 1934

CORRESPONDENCE

ALLOY FREEZING PLATES

LAST month you published a letter which commented on our recent advertising campaign featuring "direct conduction" freezing plates and it is necessary to clarify, accurately, the technical and economic considerations involved.

We support your correspondent's conclusion that little of the greatly increased heat transfer characteristics of our new plates is attributable to the material of construction; there was a slight advantage to be obtained by the use of material having high thermal conductivity, such as aluminium, but the method of construction of conventional plates offered much greater scope for improvement.

Our plates avoid two efficiency-limiting features of conventional plates; the non-conductive spaces between refrigerant passes have been replaced by additional refrigerant passes, so that nearly all the plate surface is in direct-through-metal contact with refrigerant and fully effective as freezing area. In addition to this, our method of construction readily allows the plates to be circuited to limit "back-pressure" according to the thermal loading imposed by any particular freezing duty.

The combined result of these improvements is a reduction in freezing times enabling a much higher output to be obtained from a freezer of a given size.

With regard to the statement that greater compressor capacity is required; this is ambiguous and misleading. The refrigeration requirement (compressor capacity) of any freezer is directly proportional to the rate of output but a Williams freezer is smaller, cheaper and requires fewer freezing trays for the specified output. In addition to these advantages product quality is improved due to the faster freeze.

Your correspondent states categorically that our new plates involve the User in higher capital and operating costs; this is quite wrong and the capital

cost involved is, in fact, reduced by the use of a freezer incorporation "Direct Conduction" plates.

At the risk of labouring the point; where maximum speed and output is not required, for example, in the off-peak season, our plates permit plant operation at a higher evaporating temperature whilst still freezing at the same speed is possible with conventional plates. Many of your readers will appreciate the economies involved by operation of a plant at -20°F . instead of -30°F .

J. C. Townsend,

G. Williams Engineering Co., Ltd., General Manager, London, N.W.10.

The second Danish Food Fair will take place in Aalborg, Denmark, from June 2 to 11, 1961. Enquiries should be addressed to Vesterbro 17, Aalborg.

Mr. A. M. Small has been elected a director of The Baxenden Chemical Co. Ltd. of London.

Can I Trade in My Own Name—(continued from page 968)

under his own name W. F. T. Wright. About 1943 he changed his trading style to "Wright's Chemical Company". On the containers of the defendant's baby powder sold by him the words "Wright's Baby Powder" were printed above his trade name.

Other preparations were similarly labelled. There was no evidence of confusion among the public at large, but three cases of trade confusion in respect of talcum powder and lanoline were proved. It was held by the Court of Appeal that the defendant, without any evil intent on his part, had in effect represented his business to be connected with the plaintiff's and had passed off his goods as the plaintiff's goods. Accordingly an injunction was granted to restrain the defendant from using the name "Wright" or "Wrights" on his goods without sufficiently distinguishing them from the plaintiff's, and also to restrain the Defendant from trading under a name containing "Wright" or "Wrights".



NEW MANN EGERTON BODIES

The range of refrigerated and insulated bodies produced by Mann Egerton & Co., has been extended with the two vehicles illustrated above. The Lyons body, which incorporates the

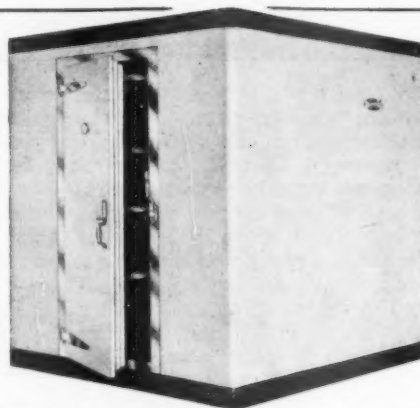
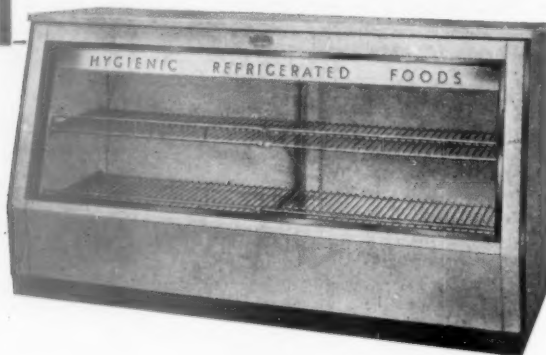


traditional corridor type of access, is mounted on a Thames 30-cwt. chassis. The insulated lorry for Ernest King & Son, Ramsey is insulated with 2 in. of expanded polystyrene and is fitted with meat rails and hooks.

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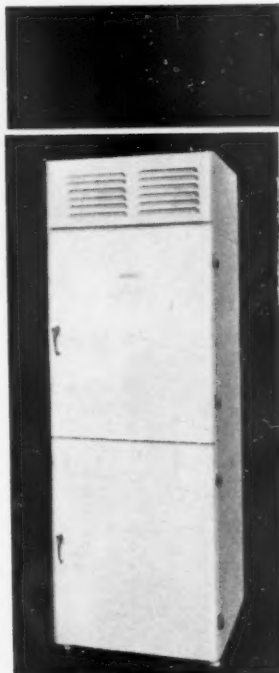
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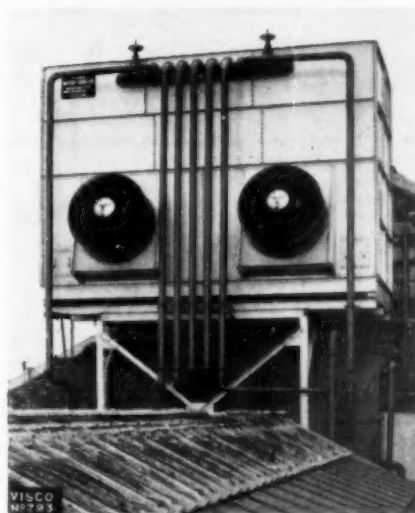
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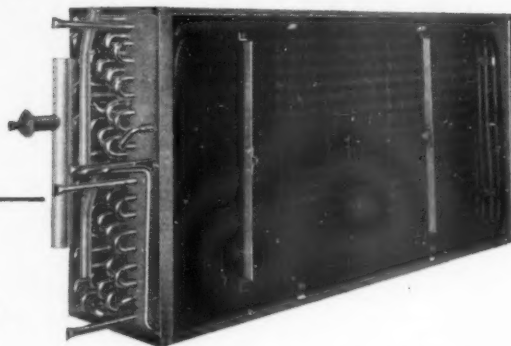
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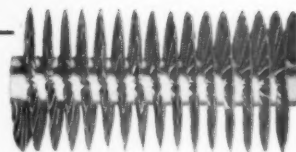
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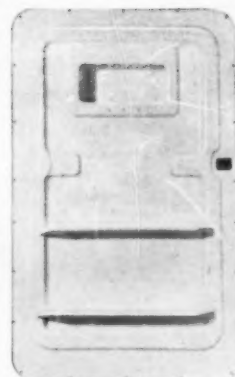
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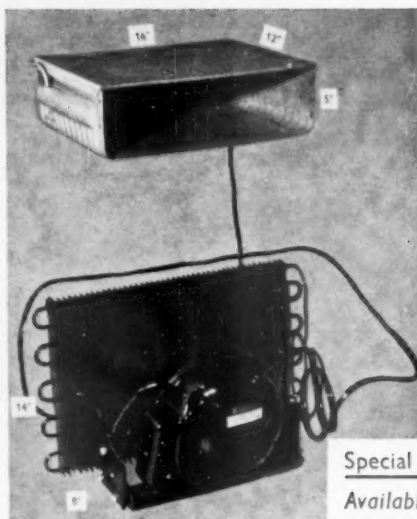
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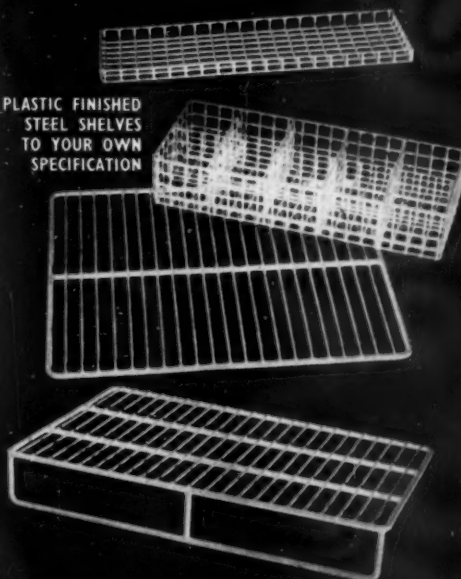
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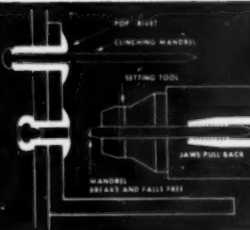
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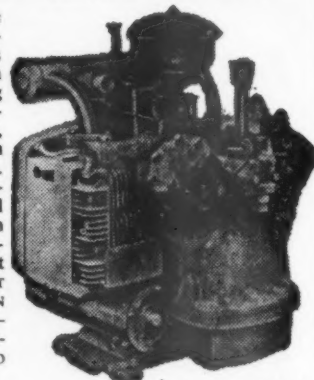
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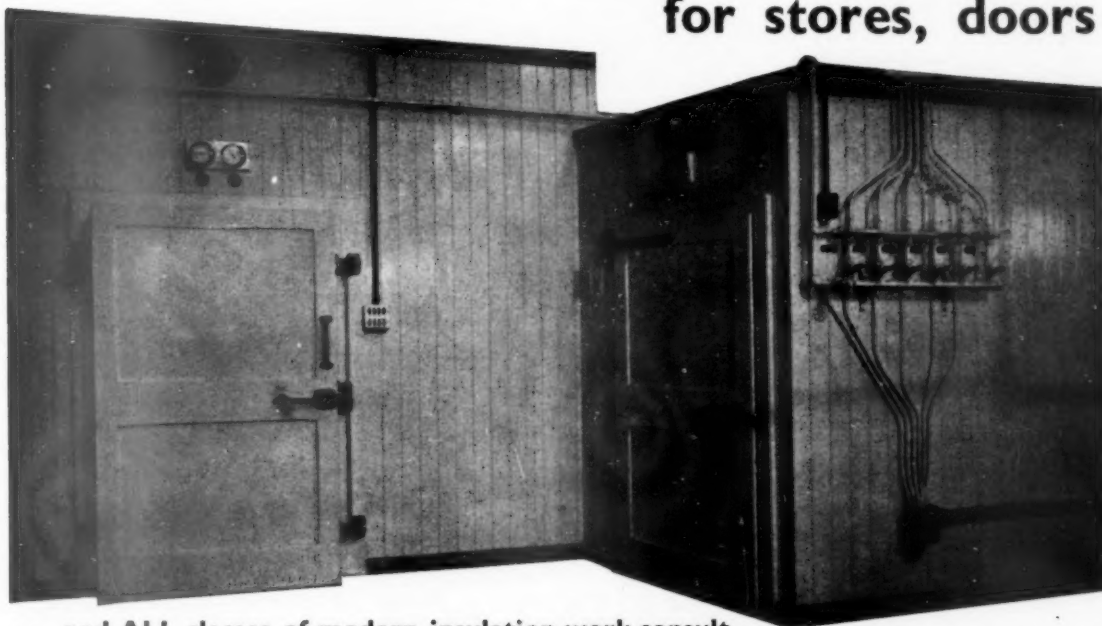
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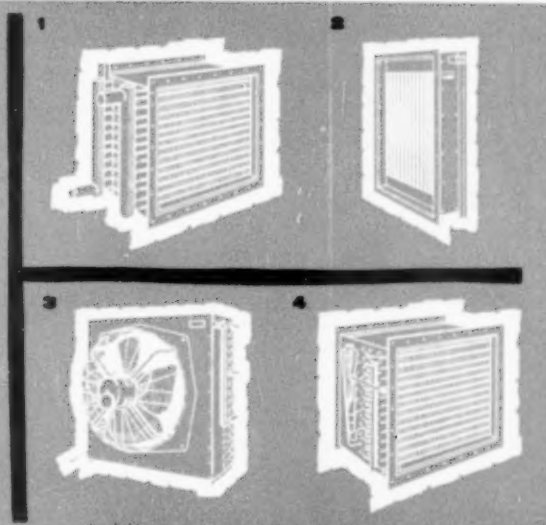
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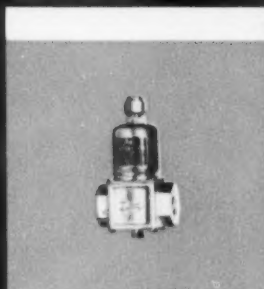
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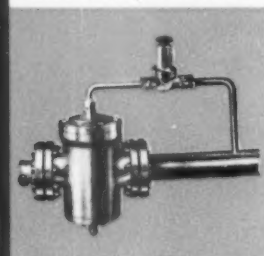
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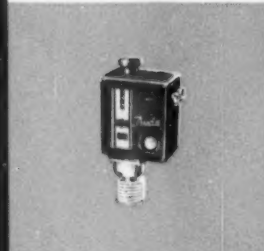
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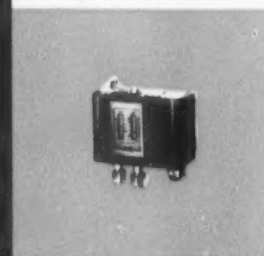
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